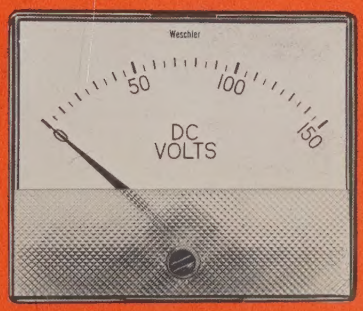
Catalog 43-300A

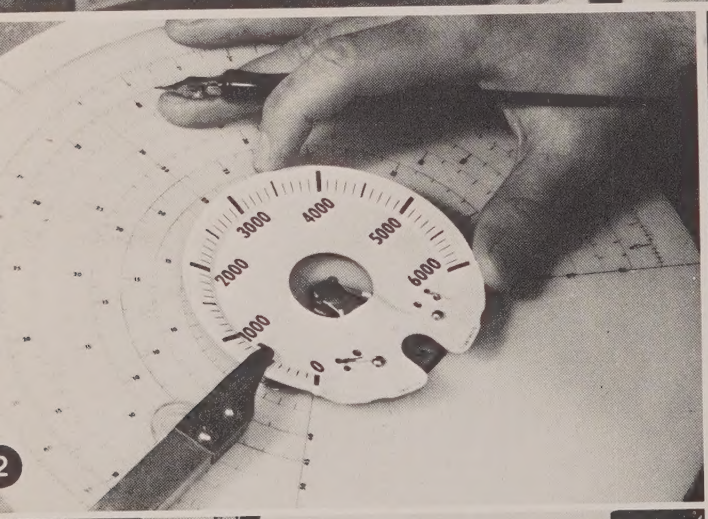
Weschler Instruments

Electric Corporation



WESCHLER ELECTRIC CORPORATION
OUR 35th YEAR
CLEVELAND OHIO

Industry's most complete line of Panel Instruments



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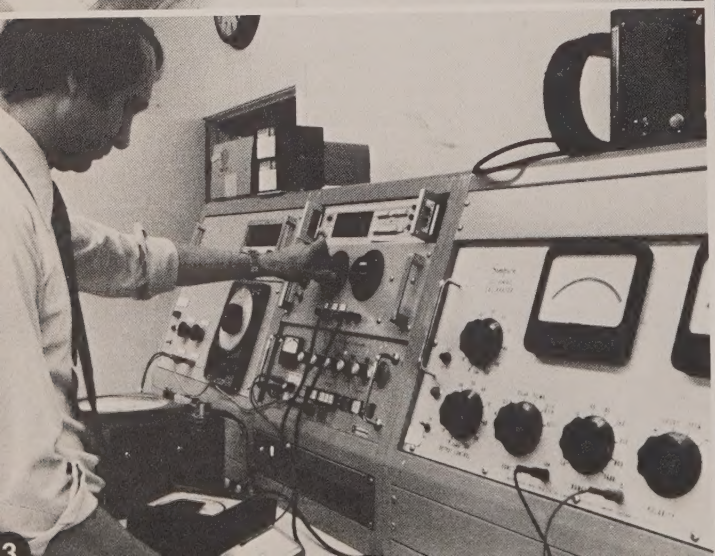
3

4

Weschler Panel Instruments

Catalog 43-300A describes the Weschler Electric Panel Instrument Line which was purchased from Westinghouse—Newark, New Jersey. Weschler instruments, made from the same tools Westinghouse had used, have the same appearance, mounting dimensions, and style numbers for easy ordering.

Having been in the panel instrument business since 1941, Weschler has wide experience in all types of instrument applications. To provide Westinghouse customers with the best possible service, Weschler acquired a complete microfilm library of Westinghouse instrument specifications as a part of the purchase.

Westinghouse Switchboard Instruments are also listed in this catalog to provide one-source instrument supply. Weschler stocks these instruments to provide the fastest possible service.

Weschler also has the capability of making up special ranges and dial captions for the instruments in this catalog.

The line is rounded out with Westinghouse current transformers, potential transformers, and instrument switches, necessary accessories to complete some installations.

Empro shunts were selected by Westinghouse as a manufacturing source when their shunt production was discontinued. We maintain complete cross-reference with the old Westinghouse line. Many ranges are available from our stock.

1. Delivery from stock on most types shown in the catalog
2. Special dial layout per customer specification
3. Calibrating instruments to specific accuracy
4. Special instrument design for customers' applications.

Weschler
Electric Corporation

4250 West 130th Street
Cleveland, Ohio 44135
216/251-4606

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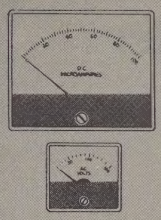
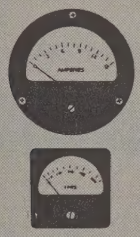
Fast-Find Index



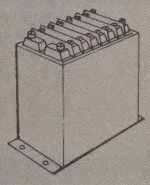
Panel Instruments
Custom-Styled
20/20 Line
2½", 3½", 4½", 5½"
Page 2-12



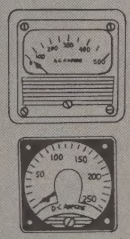
Panel Instruments
Conventional
Round, Square
3½", 4½"
Page 13-27

Elapsed Time Meters

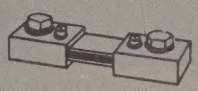
Vibrating Reed Frequency Meters
Page 28-33



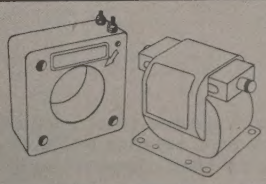
Transducers
Page 34-38



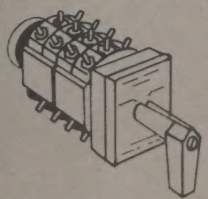
Switchboard Instruments
Circular Scale
100° Scale
Edgewise
Page 39-42



Shunts
Page 43-47



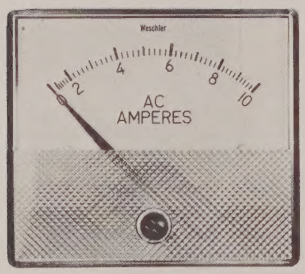
Current Transformers
Potential Transformers
Page 48-53



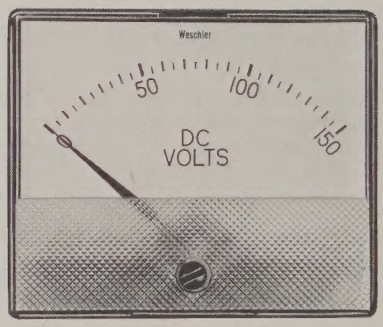
Instrument Switches
Page 54-55

Ordering Information Inside Back Cover

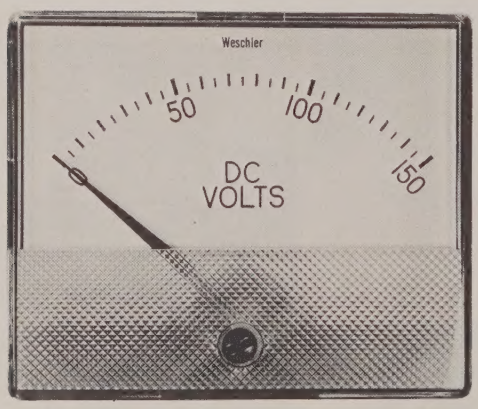
Weschler



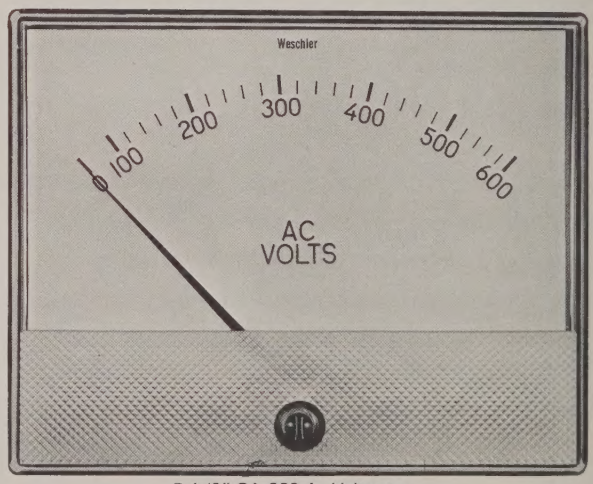
2-1/2" GA-332 Ac Ammeter



3-1/2" GX-352 Dc Voltmeter



4-1/2" GX-372 Dc Voltmeter



5-1/2" GA-382 Ac Voltmeter

20/20 line of custom panel instruments represents a style accepted in Industry to compliment the latest equipment design.

Application

20/20 instruments have neat, clean lines which harmonize with highly styled electronic components. They can be properly applied on equipment ranging from a spectrometer to a unit of power switchgear.

Readability

20/20 instruments were designed for maximum readability from a distance. The lance-design pointer in conjunction with the bold dial markings make this instrument the most easily read in its field.

Ac and Dc Custom Styled Panel Instruments

20/20 Line

Enclosures

The 20/20 instrument case is made of a black thermo-setting plastic, dimensioned to meet the industry standards for Custom Styled Panel Instruments as defined by ANSI C 39.1.

The snap-on cover is made of a high grade acrylic plastic which will remain crylstal clear in appearance. It is treated with Weschler Anti-Static Agent to keep it dust-free, and to insure continued freedom from electrostatic effects.

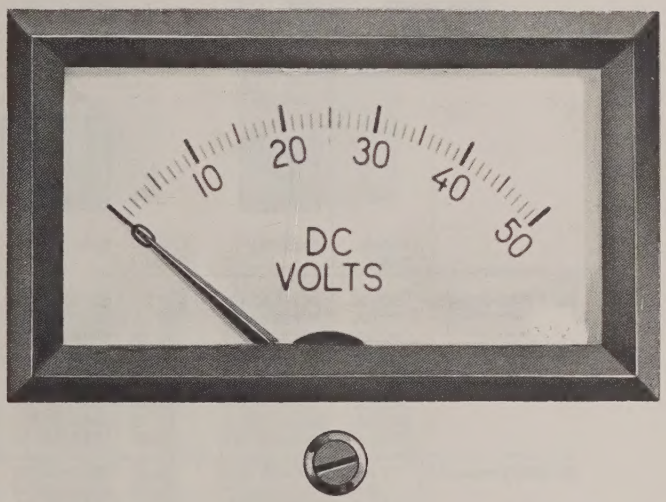
The side edges of the cover are also of clear plastic, allowing light to enter from any angle.

Rear-of-Panel Mounting

Bezels (see Fig. 4) are available for rear-of-panel mounting of each of the four sizes of instruments available.

This method of mounting permits illumination of the instrument dial through the clear plastic sides of the cover.

Rear-of-Panel Bezel Mounted 3½" GX 352 Dc Voltmeter



(Fig. 4)

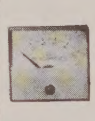
Specifications

	2½", G-332	3½", G-352	4½", G-372	5½", G-382
Dielectric Test Level	2600 Volts	2600 Volts	2600 Volts	2600 Volts
Insulation Rating		Working voltage to ground = 1100 volts peak		
Type of Pointer	Lance	Lance	Lance	Lance
Scale Arc	100°	100°	100°	100°
Scale Length	2.18"	2.82"	4.02"	4.95"
Net Weight	6 oz.	6 oz.	9 oz.	12 oz.
Shipping Weight	3 lbs.	3 lbs.	3 lbs.	3 lbs.
Bezel: Style Number	292B767G04	292B767G02	292B767G08	292B767G05
	$3.00	$3.25	$3.50	$3.75

Most instruments available from stock.

20/20 Custom Styled Panel Instruments

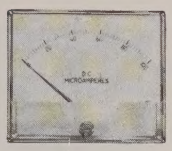
	GX-332	GX-352	GX-372	GX-382
Type.....				
Size.....	2½"	3½"	4½"	5½"
Scale Length.....	2.18"	2.82"	4.02"	4.95"
Standard Specification.....	ANSI C39.1	ANSI C39.1	ANSI C39.1	ANSI C39.1
Accuracy Class.....	2%	2%	2%	2%



	Rating, Scale	Style No.	List Price	Style No.	List Price	Style No.	List Price	Style No.	List Price	
Dc Microammeter	50 uA	606B592A09	$33.00	**606B598A09**	$34.10	606B605A09	$36.30	670B955A09	$41.55	
	80 uA	606B592A10	41.15	606B598A10	42.55	606B605A10	45.46	670B955A10	51.85	
1 A	100 uA	606B592A11	30.25	**606B598A11**	31.35	606B605A11	33.56	670B955A11	38.50	
	150 uA	606B592A12	37.20	606B598A12	38.65	606B605A12	41.50	670B955A12	47.90	
	200 uA	606B592A13	28.60	606B598A13	29.70	606B605A13	31.90	670B955A13	36.85	
	300 uA	606B592A14	36.50	606B598A14	37.90	606B605A14	40.75	670B955A14	47.20	
	500 uA	606B592A15	27.25	**606B598A15**	28.35	606B605A15	30.55	670B955A15	35.45	
	800 uA	606B592A16	35.40	606B598A16	36.85	606B605A16	39.70	670B955A16	46.15	
Dc Milliammeter	1 mA	606B591A09	25.85	606B599A09	26.95	606B604A09	29.15	670B954A09	34.10	
	1.5 mA	606B591A10	25.85	606B599A10	26.95	606B604A10	29.15	670B954A10	34.10	
2 A	2 mA	**606B591A11**	25.85	606B599A11	26.95	606B604A11	29.15	670B954A11	34.10	
	3 mA	**606B591A12**	25.85	**606B599A12**	26.95	606B604A12	29.15	670B954A12	34.10	
	5 mA	**606B591A13**	25.85	606B599A13	26.95	606B604A13	29.15	670B954A13	34.10	
	8 mA	606B591A14	25.85	606B599A14	26.95	606B604A14	29.15	670B954A14	34.10	
	10 mA	606B591A15	25.85	606B599A15	26.95	606B604A15	29.15	670B954A15	34.10	
	15 mA	**606B591A16**	25.85	606B599A16	26.95	606B604A16	29.15	670B954A16	34.10	
	20 mA	606B591A17	25.85	606B599A17	26.95	606B604A17	29.15	670B954A17	34.10	
	30 mA	606B591A18	26.95	**606B599A18**	28.05	606B604A18	30.25	670B954A18	35.20	
	50 mA	606B591A19	26.95	**606B599A19**	28.05	606B604A19	30.25	670B954A19	35.20	
	80 mA	606B591A20	26.95	606B599A20	28.05	**606B604A20**	30.25	670B954A20	35.20	
	100 mA	606B591A21	26.95	**606B599A21**	28.05	606B604A21	30.25	670B954A21	35.20	
	150 mA	606B591A22	26.95	606B599A22	28.05	606B604A22	30.25	670B954A22	35.20	
	200 mA	606B591A23	26.95	606B599A23	28.05	606B604A23	30.25	670B954A23	35.20	
	300 mA	606B591A24	26.95	**606B599A24**	28.05	606B604A24	30.25	670B954A24	35.20	
	500 mA	606B591A25	26.95	606B599A25	28.05	606B604A25	30.25	670B954A25	35.20	
	800 mA	606B591A26	26.95	606B599A26	28.05	606B604A26	30.25	670B954A26	35.20	
Dc Ammeter	1 A	606B590A09	26.95	**606B597A09**	28.05	606B603A09	30.25	670B952A09	35.20	
self-contained	1.5 A	606B590A10	26.95	606B597A10	28.05	606B603A10	30.25	670B952A10	35.20	
	2 A	606B590A11	26.95	606B597A11	28.05	606B603A11	30.25	670B952A11	35.20	
3 A	3 A	606B590A12	26.95	**606B597A12**	28.05	**606B603A12**	30.25	670B952A12	35.20	
	5 A	**606B590A13**	26.95	606B597A13	28.05	**606B603A13**	30.25	670B952A13	35.20	
	8 A	606B590A14	26.95	606B597A14	28.05	606B603A14	30.25	670B952A14	35.20	
	10 A	**606B590A15**	26.95	606B597A15	28.05	606B603A15	30.25	670B952A15	35.20	
	15 A	606B590A16	26.95	**606B597A16**	28.05	606B603A16	30.25	670B952A16	35.20	
	20 A	606B590A17	26.95	**606B597A17**	28.05	606B603A17	30.25	670B952A17	35.20	
	30 A	**606B590A18**	26.95	**606B597A18**	28.05	606B603A18	30.25	670B952A18	35.20	
	50 A	**606B590A19**	26.95	**606B597A19**	28.05	606B603A19	30.25	670B952A19	35.20	
Dc Ammeter	5 A	606B602A09	26.95	606B609A09	28.05	606B611A09	30.25	670B953A09	35.20	Shunt leads .065
for use with 50 mV	10 A	606B602A10	26.95	606B609A10	28.05	606B611A10	30.25	670B953A10	35.20	ohm resistance.
external shunt	15 A	606B602A11	26.95	**606B609A11**	28.05	606B611A11	30.25	670B953A11	35.20	
	25 A	606B602A12	26.95	606B609A12	28.05	**606B611A12**	30.25	670B953A12	35.20	
4 A	50 A	606B602A13	26.95	**606B609A13**	28.05	**606B611A13**	30.25	670B953A13	35.20	
	75 A	606B602A14	26.95	606B609A14	28.05	**606B611A14**	30.25	670B953A14	35.20	
	100 A	606B602A15	26.95	**606B609A15**	28.05	**606B611A15**	30.25	670B953A15	35.20	
	150 A	606B602A16	26.95	**606B609A16**	28.05	606B611A16	30.25	670B953A16	35.20	
	200 A	606B602A17	26.95	**606B609A17**	28.05	606B611A17	30.25	670B953A17	35.20	
	250 A	606B602A18	26.95	606B609A18	28.05	606B611A18	30.25	670B953A18	35.20	

Most instruments available from stock.

20/20 Custom Styled Panel Instruments

		GX-332		GX-352		GX-372		GX-382		
	Type.....									
	Size.....	2½"		3½"		4½"		5½"		
	Scale Length.....	2.18"		2.82"		4.02"		4.95"		
	Standard Specification.....	ANSI C39.1		ANSI C39.1		ANSI C39.1		ANSI C39.1		
	Accuracy Class.....	2%		2%		2%		2%		
										
	Rating, Scale	Style No.	List Price	Style No.	List Price	Style No.	List Price	Style No.	List Price	
Dc Ammeter for use with 50 mv external shunt	300 A	**606B602A19**	$26.95	606B609A19	$28.05	**606B611A19**	$30.25	670B953A19	$35.20	Shunt leads .065 ohm resistance
	400 A	**606B602A20**	26.95	**606B609A20**	28.05	**606B611A20**	30.25	670B953A20	35.20	
	500 A	606B602A21	26.95	606B609A21	28.05	**606B611A21**	30.25	670B953A21	35.20	
	600 A	606B602A22	26.95	**606B609A22**	28.05	606B611A22	30.25	670B953A22	35.20	
4 A Cont'd.	800 A	606B602A23	26.95	**606B609A23**	28.05	**606B611A23**	30.25	670B953A23	35.20	
	1 kA	606B602A24	26.95	606B609A24	28.05	**606B611A24**	30.25	670B953A24	35.20	
	1.5 kA	606B602A25	26.95	606B609A25	28.05	606B611A25	30.25	670B953A25	35.20	
	2 kA	606B602A26	26.95	606B609A26	28.05	606B611A26	30.25	670B953A26	35.20	
	2.5 kA	606B602A27	26.95	606B609A27	28.05	606B611A27	30.25	670B953A27	35.20	
	3 kA	606B602A28	26.95	606B609A28	28.05	606B611A28	30.25	670B953A28	35.20	
	4 kA	606B602A29	26.95	606B609A29	28.05	606B611A29	30.25	670B953A29	35.20	
	5 kA	606B602A30	26.95	606B609A30	28.05	606B611A30	30.25	670B953A30	35.20	
	6 kA	606B602A31	26.95	606B609A31	28.05	606B611A31	30.25	670B953A31	35.20	
	8 kA	606B602A32	26.95	606B609A32	28.05	606B611A32	30.25	670B953A32	35.20	
	10 kA	606B602A33	26.95	606B609A33	28.05	606B611A33	30.25	670B953A33	35.20	
Dc Millivoltmeter 5 A	20 mV	606B595A09	30.80	606B596A09	31.90	606B608A09	34.10	670B957A09	39.05	
	30 mV	606B595A10	29.15	606B596A10	30.25	606B608A10	32.45	670B957A10	37.40	
	50 mV	606B595A11	28.05	**606B596A11**	29.15	606B608A11	31.35	670B957A11	36.30	
	80 mV	606B595A12	28.05	606B596A12	29.15	606B608A12	31.35	670B957A12	36.30	
	100 mV	606B595A13	28.05	606B596A13	29.15	606B608A13	31.35	670B957A13	36.30	
	150 mV	606B595A14	28.05	606B596A14	29.15	606B608A14	31.35	670B957A14	36.30	
	200 mV	606B595A15	28.05	606B596A15	29.15	606B608A15	31.35	670B957A15	36.30	
	300 mV	606B595A16	28.05	606B596A16	29.15	606B608A16	31.35	670B957A16	36.30	
	500 mV	606B595A17	28.05	606B596A17	29.15	606B608A17	31.35	670B957A17	36.30	
	800 mV	606B595A18	28.05	606B596A18	29.15	606B608A18	31.35	670B957A18	36.30	
Dc Voltmeter 6 A	1 V	606B593A09	28.05	606B601A09	29.15	606B607A09	31.35	670B956A09	36.30	
	1.5 V	606B593A10	28.05	606B601A10	29.15	606B607A10	31.35	670B956A10	36.30	
	2 V	606B593A11	28.05	606B601A11	29.15	606B607A11	31.35	670B956A11	36.30	
	3 V	606B593A12	28.05	606B601A12	29.15	606B607A12	31.35	670B956A12	36.30	
	5 V	606B593A13	28.05	606B601A13	29.15	606B607A13	31.35	670B956A13	36.30	
	8 V	606B593A14	28.05	606B601A14	29.15	606B607A14	31.35	670B956A14	36.30	
	10 V	**606B593A15**	28.05	**606B601A15**	29.15	606B607A15	31.35	670B956A15	36.30	
	15 V	**606B593A16**	28.05	606B601A16	29.15	606B607A16	31.35	670B956A16	36.30	
	20 V	606B593A17	28.05	606B601A17	29.15	606B607A17	31.35	670B956A17	36.30	
	30 V	606B593A18	28.05	**606B601A18**	29.15	606B607A18	31.35	670B956A18	36.30	
	50 V	**606B593A19**	28.05	606B601A19	29.15	606B607A19	31.35	670B956A19	36.30	
	75 V	606B593A27	28.05	606B601A27	29.15	606B607A27	31.35	670B956A27	36.30	
	80 V	606B593A20	28.05	606B601A20	29.15	606B607A20	31.35	670B956A20	36.30	
	100 V	606B593A21	28.05	606B601A21	29.15	**606B607A21**	31.35	670B956A21	36.30	
	150 V	**606B593A22**	28.05	**606B601A22**	29.15	**606B607A22**	31.35	670B956A22	36.30	
	200 V	606B593A23	28.05	606B601A23	29.15	606B607A23	31.35	670B956A23	36.30	
	300 V	**606B593A24**	28.05	**606B601A24**	29.15	**606B607A24**	31.35	670B956A24	36.30	
	500 V	606B593A25	28.60	606B601A25	29.70	**606B607A25**	31.90	670B956A25	36.85	
	800 V	606B593A26	29.15	606B601A26	30.25	606B607A26	32.45	670B956A26	37.40	

Most instruments available from stock.

20/20 Custom Styled Panel Instruments

	GA-332	GA-352	GA-372	GA-382
Type.....	GA-332	GA-352	GA-372	GA-382
Size.....	2½"	3½"	4½"	5½"
Scale Length.....	2.18"	2.82"	4.02"	4.95"
Standard Specification.....	ANSI C39.1	ANSI C39.1	ANSI C39.1	ANSI C39.1
Accuracy Class.....	2%	2%	2%	2%

	Rating, Scale	Style No.	List Price	Style No.	List Price	Style No.	List Price	Style No.	List Price	
Ac Milliammeter self-contained	5 mA	606B924A09	$32.90	606B927A09	$34.35	606B930A09	$37.20	670B946A09	$43.65	
	8 mA	606B924A10	32.90	606B927A10	34.35	606B930A10	37.20	670B946A10	43.65	
	10 mA	606B924A11	32.90	606B927A11	34.35	606B930A11	37.20	670B946A11	43.65	
25-500 Hz	15 mA	606B924A12	32.90	606B927A12	34.35	606B930A12	37.20	670B946A12	43.65	
	20 mA	606B924A13	32.90	606B927A13	34.35	606B930A13	37.20	670B946A13	43.65	
7 A										
	30 mA	606B924A14	32.90	606B927A14	34.35	606B930A14	37.20	670B946A14	43.65	
	50 mA	606B924A15	32.90	**606B927A15**	34.35	606B930A15	37.20	670B946A15	43.65	
	80 mA	606B924A16	32.90	606B927A16	34.35	606B930A16	37.20	670B946A16	43.65	
	100 mA	606B924A17	32.90	606B927A17	34.35	606B930A17	37.20	670B946A17	43.65	
	150 mA	606B924A18	32.90	606B927A18	34.35	606B930A18	37.20	670B946A18	43.65	
	200 mA	606B924A19	32.90	606B927A19	34.35	606B930A19	37.20	670B946A19	43.65	
	300 mA	606B924A20	32.90	606B927A20	34.35	606B930A20	37.20	670B946A20	43.65	
	500 mA	606B924A21	32.90	606B927A21	34.35	606B930A21	37.20	670B946A21	43.65	
	800 mA	606B924A22	32.90	606B927A22	34.35	606B930A22	37.20	670B946A22	43.65	
Ac Ammeter self-contained	1 A	**606B923A09**	25.30	**606B926A09**	26.40	606B929A09	28.60	670B944A09	33.55	
	1.5 A	606B923A10	25.30	606B926A10	26.40	606B929A10	28.60	670B944A10	33.55	
	2 A	**606B923A11**	25.30	606B926A11	26.40	606B929A11	28.60	670B944A11	33.55	
25-500 Hz	3 A	606B923A12	25.30	**606B926A12**	26.40	606B929A12	28.60	670B944A12	33.55	
	5 A	**606B923A13**	25.30	**606B926A13**	26.40	**606B929A13**	28.60	**670B944A13**	33.55	
8 A										
	8 A	606B923A14	25.30	606B926A14	26.40	606B929A14	28.60	670B944A14	33.55	
	10 A	**606B923A15**	25.30	**606B926A15**	26.40	**606B929A15**	28.60	670B944A15	33.55	
	15 A	**606B923A16**	25.30	**606B926A16**	26.40	**606B929A16**	28.60	670B944A16	33.55	
	20 A	**606B923A17**	27.25	**606B926A17**	28.35	606B929A17	30.55	670B944A17	35.50	
	30 A	**606B923A18**	27.25	**606B926A18**	28.35	**606B929A18**	30.55	670B944A18	35.50	
	50 A	**606B923A19**	27.25	**606B926A19**	28.35	**606B929A19**	30.55	670B944A19	35.50	
Ac Ammeter for use with external current transformers	20 A	644B637A09	25.30	**644B638A09**	26.40	644B639A09	28.60	670B945A09	33.55	20/5 CT ratio
	25 A	644B637A31	25.30	644B638A31	26.40	**644B639A31**	28.60	670B945A31	33.55	25/5 CT ratio
	30 A	644B637A10	25.30	**644B638A10**	26.40	**644B639A10**	28.60	670B945A10	33.55	30/5 CT ratio
	40 A	644B637A11	25.30	644B638A11	26.40	**644B639A11**	28.60	670B945A11	33.55	40/5 CT ratio
	50 A	**644B637A12**	25.30	**644B638A12**	26.40	**644B639A12**	28.60	670B945A12	33.55	50/5 CT ratio
5 amp full scale	60 A	644B637A13	25.30	644B638A13	26.40	**644B639A13**	28.60	670B945A13	33.55	60/5 CT ratio
	75 A	**644B637A32**	25.30	**644B638A32**	26.40	**644B639A32**	28.60	670B945A32	33.55	75/5 CT ratio
25-500 Hz	80 A	644B637A14	25.30	644B638A14	26.40	644B639A14	28.60	670B945A14	33.55	80/5 CT ratio
	100 A	**644B637A15**	25.30	**644B638A15**	26.40	**644B639A15**	28.60	670B945A15	33.55	100/5 CT ratio
9 A	150 A	**644B637A16**	25.30	**644B638A16**	26.40	**644B639A16**	28.60	670B945A16	33.55	150/5 CT ratio
	200 A	**644B637A17**	25.30	**644B638A17**	26.40	**644B639A17**	28.60	670B945A17	33.55	200/5 CT ratio
	250 A	**644B637A33**	25.30	644B638A33	26.40	**644B639A33**	28.60	670B945A33	33.55	250/5 CT ratio
	300 A	**644B637A18**	25.30	**644B638A18**	26.40	**644B639A18**	28.60	670B945A18	33.55	300/5 CT ratio
	400 A	**644B637A19**	25.30	**644B638A19**	26.40	**644B639A19**	28.60	670B945A19	33.55	400/5 CT ratio
	500 A	644B637A20	25 30	**644B638A20**	26.40	**644B639A20**	28.60	670B945A20	33.55	500/5 CT ratio
	600 A	**644B637A21**	25.30	**644B638A21**	26.40	**644B639A21**	28.60	670B945A21	33.55	600/5 CT ratio
	800 A	**644B637A22**	25.30	**644B638A22**	26.40	**644B639A22**	28.60	670B945A22	33.55	800/5 CT ratio
	1 kA	644B637A23	25.30	**644B638A23**	26.40	**644B639A23**	28.60	670B945A23	33.55	1000/5 CT ratio
	1.2 kA	644B637A24	25.30	**644B638A24**	26.40	**644B639A24**	28.60	670B945A24	33.55	1200/5 CT ratio
	1.5 kA	644B637A25	25.30	644B638A25	26.40	644B639A25	28.60	670B945A25	33.55	1500/5 CT ratio
	1.6 kA	644B637A26	25.30	**644B638A26**	26.40	**644B639A26**	28.60	670B945A26	33.55	1600/5 CT ratio
	2.0 kA	644B637A27	25.30	644B638A27	26.40	**644B639A27**	28.60	670B945A27	33.55	2000/5 CT ratio
	2.5 kA	644B637A28	25.30	644B638A28	26.40	**644B639A28**	28.60	670B945A28	33.55	2500/5 CT ratio
	3.0 kA	644B637A29	25.30	644B638A29	26.40	**644B639A29**	28.60	670B945A29	33.55	3000/5 CT ratio

Most instruments available from stock.

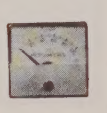
20/20 Custom Styled Panel Instruments

		GA-332		GA-352		GA-372		GA-382	
	Type.....	GA-332		GA-352		GA-372		GA-382	
	Size.....	2½"		3½"		4½"		5½"	
	Scale Length.....	2.18"		2.82"		4.02"		4.95"	
	Standard Specification.....	ANSI C39.1		ANSI C39.1		ANSI C39.1		ANSI C39.1	
	Accuracy Class.....	2%		2%		2%		2%	
	Rating, Scale	Style No.	List Price	Style No.	List Price	Style No.	List Price	Style No.	List Price
Ac Voltmeter self-contained	1.5 V	606B925A09	$32.40	606B928A09	$34.35	606B931A09	$37.20	670B947A09	$43.65
	2 V	606B925A10	32.40	606B928A10	34.35	606B931A10	37.20	670B947A10	43.65
	3 V	606B925A11	32.40	606B928A11	34.35	606B931A11	37.20	670B947A11	43.65
25-125 Hz	5 V	**606B925A12**	32.40	606B928A12	34.35	606B931A12	37.20	670B947A12	43.65
	8 V	606B925A13	32.40	606B928A13	34.35	606B931A13	37.20	670B947A13	43.65
10 A									
	10 V	606B925A14	32.40	606B928A14	34.35	606B931A14	37.20	670B947A14	43.65
	15 V	606B925A15	32.40	606B928A15	34.35	606B931A15	37.20	670B947A15	43.65
	20 V	606B925A16	32.40	606B928A16	34.35	606B931A16	37.20	670B947A16	43.65
	30 V	606B925A17	32.40	606B928A17	34.35	606B931A17	37.20	670B947A17	43.65
	50 V	606B925A18	32.40	606B928A18	34.35	606B931A18	37.20	670B947A18	43.65
	80 V	606B925A19	32.40	606B928A19	34.35	606B931A19	37.20	670B947A19	43.65
	100 V	606B925A20	32.40	606B928A20	34.35	606B931A20	37.20	670B947A20	43.65
	150 V	**606B925A21**	27.25	**606B928A21**	28.35	**606B931A21**	30.55	670B947A21	35.50
	200 V	**606B925A22**	27.25	606B928A22	28.35	606B931A22	30.55	670B947A22	35.50
	300 V	606B925A23	27.25	**606B928A23**	28.35	**606B931A23**	30.55	670B947A23	35.50
	500 V	606B925A24	34.95	**606B928A24**	36.05	**606B931A24**	38.25	670B947A24	43.20
	600 V	**606B925A25**	34.95	**606B928A25**	36.05	**606B931A25**	38.25	670B947A25	43.20

										Trans. Ratio	Rating, Volts
Ac Voltmeter for use with potential transformers	600 V	644B511A09	27.25	**644B512A09**	28.35	**644B513A09**	30.55	670B948A09	35.50	4/1	150
	3 kV	644B511A10	27.25	644B512A10	28.35	**644B513A10**	30.55	670B948A10	35.50	20/1	150
	5 kV	644B511A11	27.25	644B512A11	28.35	**644B513A11**	30.55	670B948A11	35.50	35/1	143
	6 kV	644B511A12	27.25	644B512A12	28.35	644B513A12	30.55	670B948A12	35.50	40/1	150
25-100 Hz											
11 A											

Most instruments available from stock.

20/20 Custom Styled Panel Instruments

		GC-332		GC-352		GC-372		GC-382	
	Type.....								
	Size.....	2½"		3½"		4½"		5½"	
	Scale Length.....	2.18"		2.82"		4.02"		4.95"	
	Standard Specification.....	ANSI C39.1		ANSI C39.1		ANSI C39.1		ANSI C39.1	
	Accuracy Class.....	2%		2%		2%		2%	
									
	Rating, Scale	Style No.	List Price	Style No.	List Price	Style No.	List Price	Style No.	List Price
Ac Microammeter Rectifier Type	80 uA	644B287A09	$58.40	644B290A09	$60.00	644B293A09	$63.20	670B959A09	$70.40
	100 uA	644B287A10	56.40	644B290A10	58.00	644B293A10	61.20	670B959A10	68.40
	150 uA	644B287A11	54.40	644B290A11	56.00	644B293A11	59.20	670B959A11	66.40
25-10,000 Hz	200 uA	644B287A12	53.20	644B290A12	54.80	644B293A12	58.00	670B959A12	65.20
	300 uA	644B287A13	53.20	644B290A13	54.80	644B293A13	58.00	670B959A13	65.20
12 A									
	500 uA	644B287A14	52.00	644B290A14	53.60	644B293A14	56.80	670B959A14	64.00
	800 uA	644B287A15	52.00	644B290A15	53.60	644B293A15	56.80	670B959A15	64.00
Ac Milliammeter Rectifier Type	1 mA	644B288A09	50.80	644B291A09	52.40	644B294A09	55.60	670B958A09	62.80
	1.5 mA	644B288A10	50.80	644B291A10	52.40	644B294A10	55.60	670B958A10	62.80
	2 mA	644B288A11	50.80	644B291A11	52.40	644B294A11	55.60	670B958A11	62.80
25-10,000 Hz	3 mA	644B288A12	50.80	644B291A12	52.40	644B294A12	55.60	670B958A12	62.80
	5 mA	644B288A13	50.80	644B291A13	52.40	644B294A13	55.60	670B958A13	62.80
13 A									
	8 mA	644B288A14	50.80	644B291A14	52.40	644B294A14	55.60	670B958A14	62.80
	10 mA	644B288A15	50.80	644B291A15	52.40	644B294A15	55.60	670B958A15	62.80
	15 mA	644B288A16	50.80	644B291A16	52.40	644B294A16	55.60	670B958A16	62.80
	20 mA	644B288A17	50.80	644B291A17	52.40	644B294A17	55.60	670B958A17	62.80
Ac Voltmeter Rectifier Type	3 V	644B289A09	53.20	644B292A09	54.80	644B295A09	58.00	670B960A09	65.20
	5 V	644B289A10	53.20	644B292A10	54.80	644B295A10	58.00	670B960A10	65.20
	8 V	644B289A11	53.20	644B292A11	54.80	644B295A11	58.00	670B960A11	65.20
25-10,000 Hz	10 V	644B289A12	53.20	644B292A12	54.80	644B295A12	58.00	670B960A12	65.20
	15 V	644B289A13	53.20	644B292A13	54.80	644B295A13	58.00	670B960A13	65.20
14 A									
	20 V	644B289A14	53.20	644B292A14	54.80	644B295A14	58.00	670B960A14	65.20
	30 V	644B289A15	53.20	644B292A15	54.80	644B295A15	58.00	670B960A15	65.20
	50 V	644B289A16	53.20	644B292A16	54.80	644B295A16	58.00	670B960A16	65.20
	80 V	644B289A17	53.20	644B292A17	54.80	644B295A17	58.00	670B960A17	65.20
	100 V	644B289A18	53.20	644B292A18	54.80	644B295A18	58.00	670B960A18	65.20
	150 V	644B289A19	53.20	644B292A19	54.80	644B295A19	58.00	670B960A19	65.20
	200 V	644B289A20	53.20	644B292A20	54.80	644B295A20	58.00	670B960A20	65.20
	300 V	644B289A21	53.20	644B292A21	54.80	644B295A21	58.00	670B960A21	65.20
	500 V	644B289A22	54.40	644B292A22	56.00	644B295A22	59.20	670B960A22	66.40
	800 V	644B289A23	56.40	644B292A23	58.00	644B295A23	61.20	670B960A23	68.40
Suppressed Zero Ac Voltmeter with VE2-841 transducer	110-130 volt, 25-1000 Hz	.....	.....	606B235A09	182.35	606B236A09	184.65	606B237A09	189.85
15 B	110-130 volt, Dc	.....	.....	606B235A11	195.35	606B236A11	197.50	606B237A11	202.65

Accuracy .4% mid-scale value approximate rms compensated.

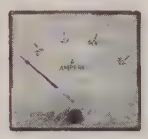
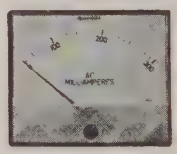
Most instruments available from stock.

20/20 Motor Load Indicators and Resistance Thermometer

	Rating, Scale	Style No.	List Price	Style No.	List Price	Style No.	List Price	Style No.	List Price	
Motor Load Indicator Ac Ammeter Type 5 amp full scale 0-150% scale 16 A		**2½" GA-332**		**3½" GA-352**		**4½" GA-372**		**5½" GA-382**		Legend "PERCENT MOTOR LOAD".
	Type A	606B923A31	$ 25.85	**606B926A31**	$ 26.95	606B929A31	$ 29.15	670B944A31	$ 33.10	**Type A** has red zone 100-150%.
	Type B	606B923A30	27.50	**606B926A30**	28.60	**606B929A30**	30.80	670B944A30	35.75	**Type B** has green zone 0-100%, yellow 100-125%, and red zone 125-150%.
		Current transformer primary equals motor full load amperes x 1.5.								
Motor Load Indicator Ac Wattmeter Type with VP2-840 transducer 120 volt, 5 amp 0-150% scale 17 B		**2½" GX-332**		**3½" GX-352**		**4½" GX-372**		**5½" GX-382**		For use with variable ratio current transformer (doughnut type). Current transformers not included.
	1 ph, Type A	606B231A11	187.50	606B232A11	188.75	606B233A11	190.35	606B234A11	195.35	
	1 ph, Type B	606B231A09	191.50	**606B232A09**	192.75	**606B233A09**	194.35	606B234A09	199.35	
	3 ph, 3w, Type A	606B231A12	252.50	606B232A12	253.75	606B233A12	255.35	606B234A12	260.35	
	3 ph, 3w, Type B	606B231A10	256.50	606B232A10	257.75	606B233A10	259.35	606B234A10	264.35	
		Single phase indicators are calibrated to 500 watts secondary full scale. Three phase indicators are calibrated to 1000 watts. Current transformer primaries are calculated to develop calibrated watts at 150% of motor full load watts.								
		When single ratio current transformers are used, the transducer must be calibrated to a specific scale watts. **Specify full scale watts input to transducer or specify current and potential transformer ratios along with full motor performance data.** Add $19.25.								
		For 240 volts, add $15.00. For 480 volts, single phase only, add $36.00.								
Motor Load Indicator Ac In-Phase Current Type with VW2-841 transducer 120/240/480 volt 5 amp full scale 18 B		**2½" GX-332**		**3½" GX-352**		**4½" GX-372**		**5½" GX-382**		For calibration in actual motor horsepower, specify current transformer ratio and watts, or current and power factor at 5/4, 4/4, 3/4 and 1/2 load. Add $19.25.
	Type A	715B345A09	163.50	715B346A09	164.75	715B347A09	166.35	715B348A09	171.35	
	Type B	715B345A10	164.75	715B346A10	166.00	715B347A10	167.60	715B348A10	172.55	
		Calibrated for average motor performance. Current transformer primary equals motor full load amperes x 1.5. Power factor .86 at full load. For other values, see AD 43-300.								A single phase wattmeter may be used in a reversed lead connection through a doughnut transformer to measure three phase motor loads.
Motor Load Indicator Dc Ammeter Type 50 mv full scale 0-150% scale 19 A		**2½" GX-332**		**3½" GX-352**		**4½"GX-372**		**5½" GX-382**		
	Type A	715B349A09	33.80	715B350A09	35.10	715B351A09	37.70	715B352A09	43.55	
	Type B	715B349A10	35.75	**715B350A10**	37.05	**715B351A10**	39.65	715B352A10	45.50	
		When available 50 mV shunt ratings do not match 150% of motor full load current within the desired accuracy limits, a 100 mV shunt with a series resistor should be used.								
Resistance Thermometer RTD Type with VT2-841 transducer 120 volt, 60 Hz 20 B				**3½" GX-352**		**4½" GX-372**		**5½" GX-382**		For use with copper temperature detector coils, 10 ohms at 25°C. (Not furnished.)
	0-100°C			715B320A09	255.75	715B322A09	257.35	715B324A09	262.35	
	0-150°C			715B320A10	255.75	715B322A10	257.35	715B324A10	262.35	
	0-200°C			715B320A11	255.75	715B322A11	257.35	715B324A11	262.35	

Most instruments available from stock.

20/20 Custom Styled Panel Instruments With Separate Serialized Transducer
Clear Plastic Cover

		GX-352		GX-372		GX-382		Notes
Type.....		GX-352		GX-372		GX-382		
Size.....		3½"		4½"		5½"		
Scale Length.....		2.82"		4.02"		4.95"		
Standard Specification.....		ANSI C39.1		ANSI C39.1		ANSI C39.1		
Accuracy Class.....		2%		2%		2%		Transducer Size: 5¾" x 3" x 4⅞"
								
Rating, Scale		Style No.	List Price	Style No.	List Price	Style No.	List Price	
Ac Wattmeter with VP2-840 transducer	1 ph, 60 Hz	714B457A09	$188.75	714B458A09	$190.35	714B459A09	$195.35	Listed styles will have preferred scales listed on pages 26-27. For any other rating between .5 and 10 amperes, order similar to these styles and consult factory.
	3 ph, 3 w, 60 Hz	714B457A21	255.75	714B458A21	257.75	714B459A21	262.35	
	3 ph, 4 w, 60 Hz	714B457A33	285.75	714B458A33	287.35	714B459A33	292.35	
	1 ph, 400 Hz	714B457A10	202.75	714B458A10	204.35	714B459A10	209.35	
5 amp, 120 volt	3 ph, 3 w, 400 Hz	714B457A22	216.75	714B458A22	218.35	714B459A22	223.75	
21 B	3 ph, 4 w, 400 Hz	714B457A34	299.75	714B458A34	301.35	714B459A34	306.35	For 240 volts, consult factory.
Ac Varmeter with VV2-840 transducer	1 ph, 60 Hz	714B457A14	233.75	714B458A14	235.35	714B459A14	240.35	For 480 volts consult factory.
	3 ph, 3 w, 60 Hz	714B457A26	293.75	714B458A26	295.35	714B459A26	300.35	
	3 ph, 4 w, 60 Hz	714B457A37	323.75	714B458A37	325.35	714B459A37	330.35	
	1 ph, 400 Hz	714B457A15	247.75	714B458A15	249.35	714B459A15	254.35	
5 amp, 120 volt	3 ph, 3 w, 400 Hz	714B457A27	307.75	714B458A27	309.35	714B459A27	314.35	
22 B	3 ph, 4 w, 400 Hz	714B457A38	337.75	714B458A38	339.35	714B459A38	344.35	**Specify current transformer and potential transformer connections and ratios as well as scale marking.**
Frequency Meter with VC2-841 transducer	55-65 Hz	**671B896A11**	226.75	**671B899A11**	228.35	671B901A11	233.35	Accuracy ±2% of span. For 240 volts, add $19.25.
	50-70 Hz	671B896A12	226.75	671B899A12	228.35	671B901A12	233.35	
	45-55 Hz	671B896A13	240.75	671B899A13	242.35	671B901A13	247.35	
	45-65 Hz	671B896A15	240.75	671B899A15	242.35	671B901A15	247.35	
120 volt	350-450 Hz	671B896A18	240.75	671B899A18	242.35	671B901A18	247.35	
23 B								
Power Factor Meter with VF2-841 transducer	1 ph, 120 volt	691B642A09	240.75	691B643A09	242.35	691B644A09	247.35	Accuracy 3% from 1 to 2 amperes. 2% from 2 to 5 amperes. For 240 volt or 3 phase 208 volt, consult factory.
	3 ph, 3 w, 120 volt	691B642A11	226.75	691B643A11	228.35	691B644A11	233.35	
	3 ph, 4 w (120/208Y)	691B642A13	240.75	691B643A13	242.35	691B644A13	247.35	
50-100-50%								
24 B								

Most instruments available from stock.

Performance

		Dc	Ac
Rated Accuracy in Percent of Full Scale		2%	2%
Overshoot — Maximum		20% Max.	20% Max.
Response Time (in Seconds):			
Microammeters	below 50 ua	3.0 Sec. Max.	1.5 Sec. Max.
	above 50 ua	1.5 Sec. Max.	1.5 Sec. Max.
RF Ammeters			2.5 Sec. Max.

For definition of above terms refer to ANSI Standard C 39.1.

Repeatability – error not detectable

Repeatability in most instrument applications is far more important than tracking or accuracy. Repeatability alone guarantees that precise duplication of an instrument reading can be made for a given set of conditions.

Modifications

Typical modifications include:

Special scales and calibration.
Customer identification or trade names.
Mirror dials and knife-edge pointers.
Colored zones.
Special legends.
Center zero.
Suppressed zero.

Ratings, Mechanisms, and Accuracy

Instrument	Case Size and Type 2½"	3½"	4½"	5½"	Ratings	Movement	①Accuracy Class
Dc Microammeters	GX-332	GX-352	GX-372	GX-382	50-800	Permanent-Magnet, Moving-Coil	±2%
Dc Milliammeters	GX-332	GX-352	GX-372	GX-382	1-800	Permanent-Magnet, Moving-Coil	±2%
Dc Ammeters, Self-Contained	GX-332	GX-352	GX-372	GX-382	1-50	Permanent-Magnet, Moving-Coil	±2%
Dc Ammeters, External Shunt	GX-332	GX-352	GX-372	GX-382	5-2500	Permanent-Magnet, Moving-Coil	±2%
Dc Millivoltmeters	GX-332	GX-352	GX-372	GX-382	20-800	Permanent-Magnet, Moving-Coil	±2%
Dc Voltmeters	GX-332	GX-352	GX-372	GX-382	1-800	Permanent-Magnet, Moving-Coil	±2%
Ac Milliammeters	GA-332	GA-352	GA-372	GA-382	5-800	Repulsion, Iron-Vane	±2%
Ac Ammeters, Self-Contained	GA-332	GA-352	GA-372	GA-382	1-50	Repulsion, Iron-Vane	±2%
Ac Ammeters, External Transformers	GA-332	GA-352	GA-372	GA-382	20-2500	Repulsion, Iron-Vane	±2%
Ac Voltmeters	GA-332	GA-352	GA-372	GA-382	1.5-600	Repulsion, Iron-Vane	±2%
Rectifier Microammeters	GC-332	GC-352	GC-372	GC-382	80-800	Rectifier with Permanent-Magnet, Moving-Coil	±3%
Rectifier Milliammeters	GC-332	GC-352	GC-372	GC-382	1-20	Rectifier with Permanent-Magnet, Moving-Coil	±3%
Rectifier Voltmeters	GC-332	GC-352	GC-372	GC-382	3-800	Rectifier with Permanent-Magnet, Moving Coil	±3%
AC Wattmeter, with External Transducer (VP2-840)	....	GX-352	GX-372	GX-382	5 A, 120 V	Permanent-Magnet, Moving-Coil	±2%
AC Varmeter, with External Transducer (VV2-841)	....	GX-352	GX-372	GX-382	5 A, 120 V	Permanent-Magnet, Moving-Coil	±2%
Frequency Meter, with External Transducer (VC2-841)	....	GX-352	GX-372	GX-382	60, 400 Hz	Permanent-Magnet, Moving-Coil	±2%
Power Factor Meter, with External Transducer (VF2-841)	....	GX-352	GX-372	GX-382	5 A, 120 V	Permanent-Magnet, Moving-Coil	±2%
Expanded Scale Voltmeter, with External Transducer (VE2-841)	....	GX-352	GX-372	GX-382	110-130 V	Permanent-Magnet, Moving-Coil	±2%
Thermometer, with External Transducer (VT2-841)	....	GX-352	GX-372	GX-382	0-200°C	Permanent-Magnet, Moving-Coil	±2%
Tachometer, with External Transducer (VR2-841)	....	GX-352	GX-372	GX-382	50-14,000 Pulses	Permanent-Magnet, Moving-Coil	±2%

①Accuracy class is stated in percent of full scale deflection, with the exception of the Frequency Meter and Expanded Scale Voltmeter which are 2% of span.

Instruments, Outline and Drilling Dimensions in Inches

Type G-332

Polarity (+) . . . (—) When Viewed From Rear (Dc Instruments Only)

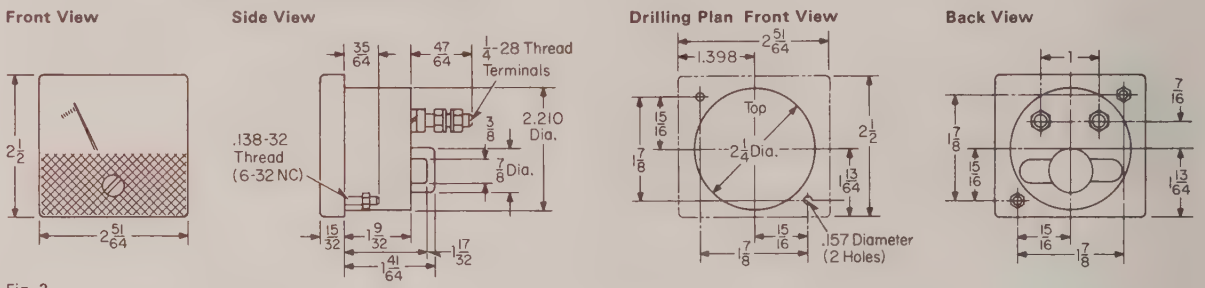


Fig. 2

Types G-352, G-372, G-382

Polarity (+) . . . (—) When Viewed From Rear (Dc Instruments Only)

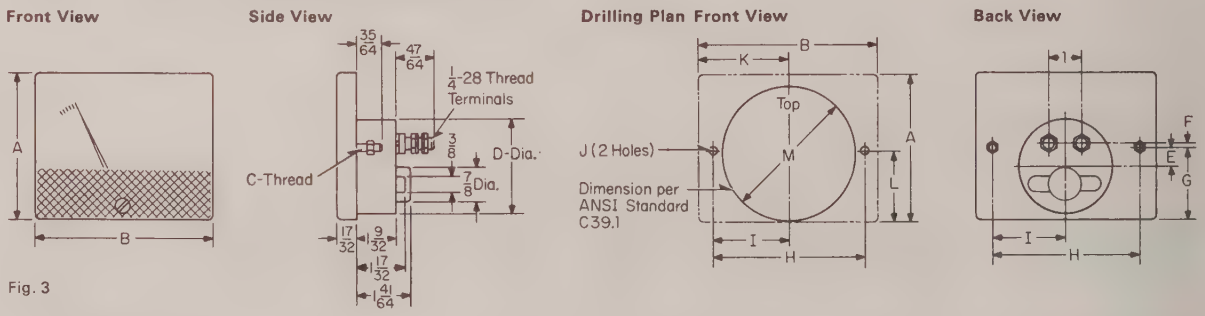


Fig. 3

Type	Dimension in Inches												
	A	B	C (Thread Size)	D	E	F	G	H	I	J (Dia.)	K	L	M (Dia.)
G-352	3	3½	.138-32 (6-32)	2.21	—	7/16	1 13/64	2⅝	1 5/16	.157	1¾	1 13/64	2¼
G-372	4	4½	.164-32 (8-32)	2.79	.08	.568	1 19/32	3½	1¾	.180	2¼	1 19/32	3
G-382	4½	5½	.164-32 (8-32)	2.79	.585	7/16	2 3/32	4½	2¼	.180	2¾	2 3/32	4

Instruments With Bezel, Outline and Drilling Dimensions in Inches

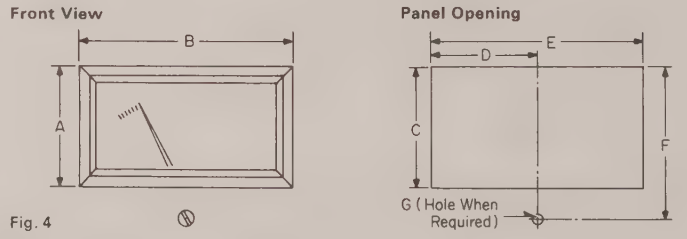


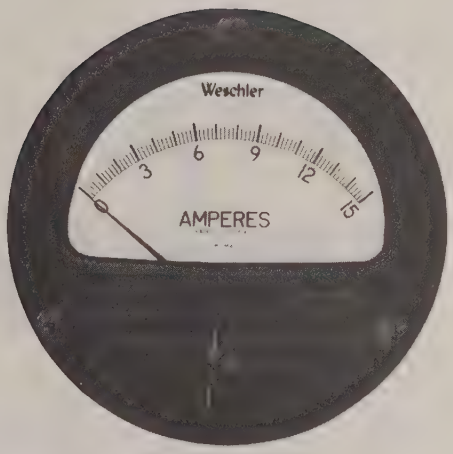
Fig. 4

Type	Dimension in Inches						
	A	B	C	D	E	F	G (Dia.)
G-332	1 23/32	3⅛	1 39/64	1½	3	2 5/64	9/32
G-352	2 17/64	3 49/64	2 5/32	1 49/64	3 23/32	2 29/64	9/32
G-372	2 29/32	4 31/32	2¾	2 13/32	4 13/16	3 9/16	⅜
G-382	3 9/16	6 1/16	3 5/32	2 61/64	5 29/32	4 1/32	⅜

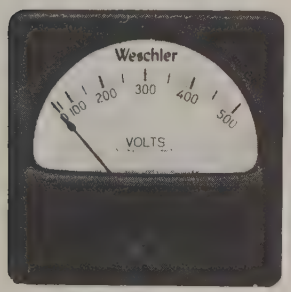
Ac and Dc Panel Instruments

Types 351, 371 — 3½", 4½" Round and Rectangular
Conventional

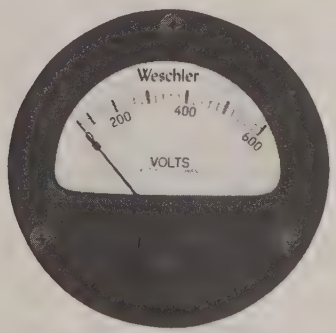
4½ Inch RX-371 Ammeter



4½ Inch NX-371 Ammeter



3½ Inch RA-351 Voltmeter



3½ Inch NA-351 Voltmeter

Application

Weschler Types 351 and 371 meet all performance requirements of ANSI C-39.1-1964 for round and rectangular panel instruments.

They employ conventional pivot and jewel mechanisms enclosed in black fluted cases designed to match the appearance of Westinghouse switchboard instruments and relays, and other devices used on traditionally styled control panels.

Available Types

Microammeters (dc, rectifier)
Milliammeters (dc, ac, radio frequency)
Ammeters (dc, ac, radio frequency)
Millivoltmeters (dc)
Voltmeters (dc, ac, rectifier)
Frequency Meters (transducer type ac)
Wattmeters (transducer type ac)
Varmeters (transducer type ac)
Motor Load Indicators (ammeter, wattmeter, in-phase current)
Power Factor Meter (transducer type ac)
Thermometer (transducer type ac)

Features

High Torque To Weight Ratio: Insures rapid, accurate readings with high damping and minimum frictional effect.

Easy To Read Scales: Linear on dc. Virtually linear above 10% of full scale on ac.

Self Shielding: DC types are magnetically shielded and calibration is unaffected regardless of material or thickness of mounting panel. AC types are unshielded.

Specifications

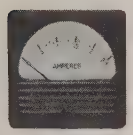
	3½"		4½"	
	X,C, and T 351	A 351	X, C, and T 371	A 371
Peak working voltage to ground	1100 volts	1100 volts	1100 volts	1100 volts
Dielectric test level	2600 volts	2600 volts	2600 volts	2600 volts
Type of pointer	Lance	Spade	Lance	Spade
Scale length	2.4"	2.06"	3.2"	2.8"
Scale arc	100°	85°	100°	85°
Net weight	7 oz.	8 oz.	12 oz.	12 oz.
Shipping weight	3 lbs.	3 lbs.	3 lbs.	3 lbs.

Conventional Panel Instruments

		RX-351 Rectangular		NX-351 Round		RX-371 Rectangular		NX-371 Round		Notes
Type.....										
Size.....		3½"		3½"		4½"		4½"		
Scale Length.....		2.4"		2.4"		3.2"		3.2"		
Standard Specification.....		ANSI C39.1		ANSI C39.1		ANSI C39.1		ANSI C39.1		
Accuracy Class.....		2%		2%		2%		2%		
	Rating, Scale	Style No.	List Price	Style No.	List Price	Style No.	List Price	Style No.	List Price	
Dc Microammeter self-contained	20 uA	**291B554A10**	$61.75	291B554A21	$61 75	291B290A09	$64.65	291B290A21	$64.65	
	30 uA	291B554A11	73.52	291B554A22	73 52	291B290A10	76.55	291B290A22	76.55	
	50 uA	291B554A12	43.25	291B554A23	43 25	291B290A11	47.00	291B290A23	47.00	
25 A	80 uA	409C534A15	55.20	409C534A27	55 20	409C569A14	58.95	409C569A26	58.95	
	100 uA	**409C534A09**	37.90	409C534A21	37.90	**409C569A08**	40.85	409C569A20	40.85	
	150 uA	409C534A10	38.65	409C534A22	38.65	409C569A09	41.50	409C569A21	41.50	
	200 uA	**409C534A11**	32.60	409C534A23	32 60	**409C569A10**	35.65	409C569A22	35 65	
	300 uA	409C534A12	37.90	409C534A24	37 90	409C569A11	40.75	409C569A23	40.75	
	500 uA	409C534A13	31.25	409C534A25	31 25	409C569A12	34.45	409C569A24	34.45	
	800 uA	409C534A14	36.85	409C534A26	36 85	409C569A13	39.70	409C569A25	39.70	
Dc Milliammeter self-contained	1 mA	**409C531A08**	26.95	409C531A32	26.95	**409C565A08**	32.20	409C565A32	32.20	All self-contained milliammeters above 15 mA full scale are shunted internally, and have a terminal drop of 50 mV at full scale.
	1.5 mA	409C531A09	26.95	409C531A33	26.95	409C565A09	32.20	409C565A33	32.20	
	2 mA	409C531A10	26.95	409C531A34	26.95	409C565A10	32.20	409C565A34	32.20	
26 A	3 mA	**409C531A11**	26.95	409C531A35	26.95	409C565A11	32.20	409C565A35	32 20	
	5 mA	409C531A12	26.95	409C531A36	26.95	409C565A12	32.20	409C565A36	32 20	
	8 mA	409C531A13	26.95	409C531A37	26.95	409C565A13	32.20	409C565A37	32.20	
	10 mA	409C531A14	26.95	409C531A38	26.95	409C565A14	32.20	409C565A38	32.20	
	15 mA	**409C531A15**	26.95	409C531A39	26.95	409C565A15	32.20	409C565A39	32.20	
	20 mA	409C531A16	26.95	409C531A40	26.95	409C565A16	32.20	409C565A40	32.20	
	30 mA	**409C531A17**	28.05	409C531A41	28.05	409C565A17	33.30	409C565A41	33.30	
	50 mA	**409C531A18**	28.05	409C531A42	28.05	409C565A18	33.30	409C565A42	33.30	
	80 mA	409C531A19	28.05	409C531A43	28.05	409C565A19	33.30	409C565A43	33.30	
	100 mA	**409C531A20**	28.05	409C531A44	28.05	409C565A20	33.30	409C565A44	33.30	
	150 mA	409C531A21	28.05	409C531A45	28 05	409C565A21	33.30	409C565A45	33.30	
	200 mA	**409C531A22**	28.05	409C531A46	28 05	409C565A22	33.30	409C565A46	33.30	
	300 mA	**409C531A23**	28.05	409C531A47	28.05	409C565A23	33.30	409C565A47	33.30	
	400 mA	409C531A26	28.05	409C531A50	28.05	.....	.....	.....	.....	
	500 mA	**409C531A24**	28.05	409C531A48	28.05	409C565A24	33.30	409C565A48	33.30	
	800 mA	409C531A25	28.05	409C531A49	28.05	409C565A25	33.30	409C565A49	33.30	
Dc Ammeter self-contained	1 a	**409C530A08**	28.05	409C530A32	28.05	409C568A08	33.30	409C568A32	33.30	Self-contained ammeters are shunted internally and have a terminal drop of 50 mV at full scale.
	1.5 a	409C530A09	28.05	409C530A33	28 05	409C568A09	33 30	409C568A33	33.30	
	2 a	**409C530A10**	28.05	409C530A34	28.05	409C568A10	33.30	409C568A34	33.30	
27 A	3 a	409C530A11	28.05	409C530A35	28 05	409C568A11	33.30	409C568A35	33.30	
	5 a	**409C530A12**	28.05	409C530A36	28.05	409C568A12	33.30	409C568A36	33.30	
	8 a	409C530A13	28.05	409C530A37	28.05	409C568A13	33.30	409C568A37	33.30	
	10 a	**409C530A14**	28.05	409C530A38	28.05	409C568A14	33.30	409C568A38	33.30	
	15 a	409C530A15	28.05	409C530A39	28.05	**409C568A15**	33.30	409C568A39	33.30	
	20 a	**409C530A16**	28.05	409C530A40	28.05	**409C568A16**	33.30	409C568A40	33.30	
	30 a	**409C530A17**	28.05	**409C530A41**	28.05	**409C568A17**	33.30	409C568A41	33.30	
	50 a	**409C530A18**	28.05	**409C530A42**	28.05	**409C568A18**	33.30	409C568A42	33.30	

Most instruments available from stock.

Conventional Panel Instruments

	Rating, Scale	Style No.	List Price	Style No.	List Price	Style No.	List Price	Style No.	List Price	Notes
Type.....		RX-351 Rectangular		NX-351 Round		RX-371 Rectangular		NX-371 Round		
Size.....		3½"		3½"		4½"		4½"		
Scale Arc.....		2.4"		2.4"		3.2"		3.2"		
Standard Specification.....		ANSI C39.1		ANSI C39.1		ANSI C39.1		ANSI C39.1		
Accuracy Class.....		2%		2%		2%		2%		
										
Dc Ammeter for use with external 50 mv shunts	15 A	409C530A20	$28.05	409C530A48	$28.05	409C568A20	$33.30	409C568A48	$33.30	Calibrated for standard lead resistance .065 ohm.
	20 A	409C530A21	28.05	409C530A49	28.05	409C568A21	33.30	409C568A49	33.30	
	30 A	409C530A22	28.05	409C530A50	28.05	409C568A22	33.30	409C568A50	33.30	
	50 A	409C530A23	28.05	409C530A51	28.05	409C568A23	33.30	409C568A51	33.30	
28 A	80 A	409C530A24	28.05	409C530A52	28.05	**409C568A24**	33.30	409C568A52	33.30	
	100 A	**409C530A25**	28.05	409C530A53	28.05	**409C568A25**	33.30	409C568A53	33.30	
	150 A	**409C530A26**	28.05	409C530A54	28.05	**409C568A26**	33.30	409C568A54	33.30	
	200 A	**409C530A27**	28.05	409C530A55	28.05	409C568A27	33.30	409C568A55	33.30	
	300 A	409C530A28	28.05	409C530A56	28.05	**409C568A28**	33.30	409C568A56	33.30	
	400 A	**409C530A29**	28.05	409C530A57	28.05	**409C568A29**	33.30	409C568A57	33.30	
	500 A	409C530A30	28.05	409C530A58	28.05	409C568A30	33.30	409C568A58	33.30	
	600 A	.....	.....	409C530A62	28.05	409C568A62	33.30	.....	.....	
	800 A	.....	.....	409C530A63	28.05	409C568A63	33.30	.....	.....	
	1.0 kA	.....	.....	409C530A59	28.05	.....	.....	.....	.....	
Dc Ammeter for use with 50 or 100 mv. external shunt	50 mV	409C534A50	33.55	409C534A55	33.55	409C569A50	38.80	409C569A63	38.80	Full scale dial marking to suit shunt. When ordering **Specify full scale dial marking desired, shunt current and millivolt rating, and shunt lead resistance.**
	100 mV	409C615A08	33.55	409C615A24	33.55	409C622A08	38.80	409C622A24	38.80	
scale not listed in section 55										
29 A										
Dc Millivoltmeter self-contained	50 mV	409C534A32	29.15	409C534A41	29.15	409C569A32	34.40	409C569A41	34.40	**Specify source impedance; not required if used with shunt.**
	100 mV	409C534A33	29.15	409C534A42	29.15	409C569A33	34.40	409C569A42	34.40	
	200 mV	409C534A34	29.15	409C534A43	29.15	409C569A34	34.40	409C569A43	34.40	
30 A	500 mV	409C534A35	29.15	409C534A44	29.15	409C569A35	34.40	409C569A44	34.40	
Dc Voltmeter self-contained	1 V	409C532A09	29.15	409C532A36	29.15	409C570A09	34.40	409C570A36	34.40	1,000 ohms per volt.
	1.5 V	409C532A10	29.15	409C532A37	29.15	409C570A10	34.40	409C570A37	34.40	
	2 V	409C532A11	29.15	409C532A38	29.15	409C570A11	34.40	409C570A38	34.40	
31 A	3 V	409C532A12	29.15	409C532A39	29.15	409C570A12	34.40	409C570A39	34.40	
	5 V	409C532A13	29.15	409C532A40	29.15	409C570A13	34.40	409C570A40	34.40	
	8 V	409C532A14	29.15	409C532A41	29.15	409C570A14	34.40	409C570A41	34.40	
	10 V	409C532A15	29.15	409C532A42	29.15	409C570A15	34.40	409C570A42	34.40	
	15 V	409C532A16	29.15	409C532A43	29.15	409C570A16	34.40	409C570A43	34.40	
	20 V	409C532A17	29.15	409C532A44	29.15	409C570A17	34.40	409C570A44	34.40	
	30 V	**409C532A18**	29.15	409C532A45	29.15	409C570A18	34.40	409C570A45	34.40	
	40 V	.....	.....	.....	.....	409C570A28	34.40	409C570A55	34.40	
	50 V	**409C532A19**	29.15	**409C532A46**	29.15	409C570A19	34.40	409C570A46	34.40	
	80 V	409C532A20	29.15	409C532A47	29.15	409C570A20	34.40	409C570A47	34.40	
	100 V	**409C532A21**	29.15	409C532A48	29.15	409C570A21	34.40	409C570A48	34.40	
	150 V	**409C532A22**	29.15	409C532A49	29.15	**409C570A22**	34.40	409C570A49	34.40	
	200 V	409C532A23	29.15	409C532A50	29.15	409C570A23	34.40	409C570A50	34.40	
	300 V	**409C532A24**	29.15	**409C532A51**	29.15	**409C570A24**	34.40	409C570A51	34.40	
	400 V	409C532A28	29.70	409C532A55	29.70	.....	.....	.....	.....	
	500 V	**409C532A25**	29.70	409C532A52	29.70	**409C570A25**	34.95	409C570A52	34.95	
	600 V	409C532A27	29.70	409C532A54	29.70	409C570A26	34.95	409C570A53	34.95	
	800 V	409C532A26	30.25	409C532A53	30.25	409C570A27	35.50	409C570A54	35.50	

Most instruments available from stock.

Conventional Panel Instruments

	Rating, Scale	RA-351 Rectangular 3½" 2.4" ANSI C39.1 2% Style No.	List Price	NA-351 Round 3½" 2.4" ANSI C39.1 2% Style No.	List Price	RA-371 Rectangular 4½" 3.2" ANSI C39.1 2% Style No.	List Price	NA-371 Round 4½" 3.2" ANSI C39.1 2% Style No.	List Price	Notes
Ac Milliammeter self-contained	5 mA	291B272A26	$34.35	291B272A09	$34.35	291B294A26	$41.15	291B294A09	$41.15	
	10 mA	291B272A27	34.35	291B272A10	34.35	291B294A27	41.15	291B294A10	41.15	
	20 mA	291B272A28	34.35	291B272A11	34.35	291B294A28	41.15	291B294A11	41.15	
25-500 Hz	50 mA	291B272A29	34.35	291B272A12	34.35	291B294A29	41.15	291B294A12	41.15	
	100 mA	**291B272A30**	34.35	291B272A13	34.35	291B294A30	41.15	291B294A13	41.15	
32 A										
	150 mA	.....	.....	.....	.....	291B294A33	41.15	291B294A16	41.15	
	200 mA	291B272A31	34.35	291B272A14	34.35	291B294A31	41.15	291B294A14	41.15	
	500 mA	291B272A32	34.35	291B272A15	34.35	291B294A32	41.15	291B294A15	41.15	
Ac Ammeter self-contained	1 A	409C676A25	26.40	409C676A09	26.40	409C693A25	31.65	409C693A09	31.65	
	1.5 A	409C676A26	26.40	409C676A10	26.40	409C693A26	31.65	409C693A10	31.65	
	2 A	**409C676A27**	26.40	409C676A11	26.40	409C693A27	31.65	409C693A11	31.65	
25-500 Hz	3 A	**409C676A28**	26.40	409C676A12	26.40	409C693A28	31.65	409C693A12	31.65	
	5 A	**409C676A29**	26.40	**409C676A13**	26.40	**409C693A29**	31.65	409C693A13	31.65	
33 A										
	8 A	409C676A30	26.40	409C676A14	26.40	409C693A30	31.65	409C693A14	31.65	
	10 A	**409C676A31**	26.40	**409C676A15**	26.40	**409C693A31**	31.65	409C693A15	31.65	
	15 A	409C676A36	26.40	409C676A20	26.40	.....	.....	409C693A20	31.65	
	20 A	**409C676A32**	28.35	**409C676A16**	28.35	409C693A32	33.55	409C693A16	33.55	
	30 A	**409C676A33**	28.35	**409C676A17**	28.35	**409C693A33**	33.55	409C693A17	33.55	
	50 A	**409C676A34**	28.35	**409C676A18**	28.35	**409C693A34**	33.55	409C693A18	33.55	
Ac Ammeter for use with current transformer	20 A	291B280A09	26.40	291B281A09	26.40	291B292A09	31.65	291B293A09	31.65	20/5 CT ratio
	25 A	.....	.....	.....	.....	291B292A32	31.65	291B293A32	31.65	25/5 CT ratio
	30 A	291B280A10	26.40	291B281A10	26.40	**291B292A10**	31.65	291B293A10	31.65	30/5 CT ratio
	40 A	291B280A11	26.40	291B281A11	26.40	291B292A11	31.65	291B293A11	31.65	40/5 CT ratio
25-500 Hz	50 A	**291B280A12**	26.40	**291B281A12**	26.40	**291B292A12**	31.65	291B293A12	31.65	50/5 CT ratio
	60 A	291B280A13	26.40	291B281A13	26.40	291B292A13	31.65	291B293A13	31.65	60/5 CT ratio
5 amp full scale	75 A	**291B280A26**	26.40	**291B281A26**	26.40	**291B292A31**	31.65	291B293A31	31.65	75/5 CT ratio
	80 A	291B280A14	26.40	291B281A14	26.40	291B292A14	31.65	291B293A14	31.65	80/5 CT ratio
	100 A	**291B280A15**	26.40	**291B281A15**	26.40	**291B292A15**	31.65	**291B293A15**	31.65	100/5 CT ratio
34 A	150 A	**291B280A16**	26.40	**291B281A16**	26.40	**291B292A16**	31.65	291B293A16	31.65	150/5 CT ratio
	200 A	**291B280A17**	26.40	**291B281A17**	26.40	**291B292A17**	31.65	291B293A17	31.65	200/5 CT ratio
	300 A	**291B280A18**	26.40	**291B281A18**	26.40	**291B292A18**	31.65	291B293A18	31.65	300/5 CT ratio
	400 A	**291B280A19**	26.40	**291B281A19**	26.40	**291B292A19**	31.65	291B293A19	31.65	400/5 CT ratio
	500 A	**291B280A20**	26.40	291B281A20	26.40	**291B292A20**	31.65	291B293A20	31.65	500/5 CT ratio
	600 A	**291B280A21**	26.40	**291B281A21**	26.40	**291B292A21**	31.65	291B293A21	31.65	600/5 CT ratio
	800 A	**291B280A22**	26.40	**291B281A22**	26.40	**291B292A22**	31.65	291B293A22	31.65	800/5 CT ratio
	1.0 kA	291B280A23	26.40	291B281A23	26.40	**291B292A23**	31.65	291B293A23	31.65	1000/5 CT ratio
	1.2 kA	**291B280A29**	26.40	291B281A29	26.40	**291B292A24**	31.65	291B293A24	31.65	1200/5 CT ratio
	1.5 kA	291B280A24	26.40	291B281A24	26.40	**291B292A25**	31.65	291B293A25	31.65	1500/5 CT ratio
	1.6 kA	291B280A30	26.40	291B281A30	26.40	291B292A26	31.65	291B293A26	31.65	1600/5 CT ratio
	2.0 kA	**291B280A25**	26.40	291B281A25	26.40	291B292A27	31.65	291B293A27	31.65	2000/5 CT ratio
	2.5 kA	291B280A31	26.40	291B281A31	26.40	291B292A29	31.65	291B293A29	31.65	2500/5 CT ratio
	3.0 kA	291B280A32	26.40	291B281A32	26.40	291B292A30	31.65	291B293A30	31.65	3000/5 CT ratio

Most instruments available from stock.

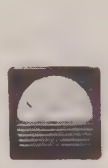
Conventional Panel Instruments

Type	RA-351 Rectangular		NA-351 Round		RA-371 Rectangular		NA-371 Round		Notes
Size	3½"		3½"		4½"		4½"		
Scale Arc	2.4"		2.4"		3.2"		3.2"		
Standard Specification	ANSI C39.1		ANSI C39.1		ANSI C39.1		ANSI C39.1		
Accuracy Class	2%		2%		2%		2%		
	Rating, Scale	Style No.	List Price	Style No.	List Price	Style No.	List Price	Style No.	List Price	
Ac Ammeter for use with current transformer scale not listed in section 61 5 amp full scale 25-500 Hz 35 A	scaled to match current transformer	409C676A35	$32.75	409C676A19	$32.75	409C693A35	$37.95	409C693A19	$37.95	**Specify current transformer ratings.**
Ac Voltmeter self-contained 25-125 Hz 36 A	1.5 V	409C677A36	34.35	409C677A08	34.35	409C692A36	35.40	409C692A08	35.40	1.5, 2, 3, and 5 volt ratings are calibrated for use with external leads of .065 ohm resistance.
	2 V	409C677A37	34.35	409C677A09	34.35	409C692A37	35.40	409C692A09	35.40	
	3 V	409C677A38	34.35	409C677A10	34.35	409C692A38	35.40	409C692A10	35.40	
	5 V	409C677A39	34.35	409C677A11	34.35	409C692A39	35.40	409C692A11	35.40	
	8 V	409C677A40	34.35	409C677A12	34.35	409C692A40	35.40	409C692A12	35.40	
	10 V	409C677A41	34.35	409C677A13	34.35	409C692A41	35.40	409C692A13	35.40	
	15 V	409C677A42	34.35	409C677A14	34.35	409C692A42	35.40	409C692A14	35.40	
	20 V	409C677A43	34.35	409C677A15	34.35	409C692A43	35.40	409C692A15	35.40	
	30 V	**409C677A44**	34.35	409C677A16	34.35	409C692A44	35.40	409C692A16	35.40	
	50 V	409C677A45	34.35	409C677A17	34.35	409C692A45	35.40	409C692A17	35.40	
	80 V	409C677A46	34.35	409C677A18	34.35	409C692A46	35.40	409C692A18	35.40	
	100 V	409C677A47	34.35	409C677A19	34.35	409C692A47	35.40	409C692A19	35.40	
	150 V	**409C677A48**	28.35	**409C677A20**	28.35	**409C692A48**	33.55	409C692A20	33.55	
	200 V	409C677A49	28.35	409C677A21	28.35	409C692A49	33.55	409C692A21	33.55	
	300 V	**409C677A50**	28.35	**409C677A22**	28.35	**409C692A50**	33.55	**409C692A22**	33.55	
	500 V	.....	.....	.....	.....	**409C692A51**	41.25	409C692A23	41.25	
	600 V	409C677A56	36.05	**409C677A28**	36.05	**409C692A55**	41.25	409C692A27	41.25	
	750 V	.....	.....	.....	.....	409C692A56	41.25	409C692A28	41.25	
	800 V	.....	.....	.....	.....	**409C692A52**	41.35	409C692A24	41.25	
		supplied with external resistor								
	500 V	409C677A51	36.05	409C677A23	36.05	.....	.....	.....	.....	
	800 V	409C677A52	39.05	409C677A24	39.05	.....	.....	.....	.....	

Ac Voltmeter for use with potential transformer 25-125 Hz 150 volts full scale 37 A										Transformer Ratio	Volts–Rating
	300 V	.....	.....	.....	.....	186A330A24	33.55	186A330A12	33.55	2:1	150
	600 V	186A329A21	28.35	186A329A09	28.35	**186A330A21**	33.55	186A330A09	33.55	4:1	150
	3 kV	186A329A22	28.35	186A329A10	28.35	**186A330A22**	33.55	186A330A10	33.55	20:1	150
Ac Voltmeter scale not listed in section 64 150 volts full scale 38 A	scaled to match potential transformer	186A329A24	34.40	186A329A12	34.40	186A330A26	39.60	186A330A13	39.60	For other than 150 volts full scale, consult factory. **Specify "Similar to style number" shown, and give potential transformer type and rating, and scale desired.**	

Most instruments available from stock.

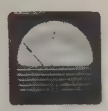
Conventional Panel Instruments

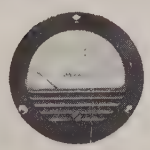
		RT-351 Rectangular		NT-351 Round		RT-371 Rectangular		NT-371 Round		Notes
Type.....										
Size.....		3½"		3½"		4½"		4½"		
Scale Arc.....		2.4"		2.4"		3.2"		3.2"		
Standard Specification.....		ANSI C39.1		ANSI C39.1		ANSI C39.1		ANSI C39.1		
Accuracy Class.....		2%		2%		2%		2%		
										
	Rating, Scale	Style No.	List Price	Style No.	List Price	Style No.	List Price	Style No.	List Price	
Milliammeter Radio Frequency Type square law scale 39 B	10 mA	409C550A09	$124.00	409C550A37	$124.00	409C571A08	$128.65	409C571A37	$128.65	
	20 mA	409C550A10	124.00	409C550A38	124.00	409C571A09	128.65	409C571A38	128.65	
	50 mA	409C550A11	124.00	409C550A39	124.00	409C571A10	128.65	409C571A39	128.65	
	100 mA	409C550A12	124.00	409C550A40	124.00	409C571A11	128.65	409C571A40	128.65	
	150 mA	409C550A13	124.00	409C550A41	124.00	409C571A12	128.65	409C571A41	128.65	
	200 mA	409C550A14	124.00	409C550A42	124.00	409C571A13	128.65	409C571A42	128.65	
	300 mA	409C550A15	124.00	409C550A43	124.00	409C571A14	128.65	409C571A43	128.65	
	500 mA	409C550A16	55.25	409C550A44	55.25	409C571A15	57.55	409C571A44	57.55	
	800 mA	409C550A17	55.25	409C550A45	55.25	409C571A16	57.55	409C571A45	57.55	
Milliammeter Radio Frequency Type self-contained linear expanded scale 40 B	10 mA	409C550A23	146.00	409C550A51	146.00	409C571A23	150.65	409C571A51	150.65	
	20 mA	409C550A24	146.00	409C550A52	146.00	409C571A24	150.65	409C571A52	150.65	
	50 mA	409C550A25	146.00	409C550A53	146.00	409C571A25	150.65	409C571A53	150.65	
	100 mA	409C550A26	146.00	409C550A54	146.00	409C571A26	150.65	409C571A54	150.65	
	150 mA	409C550A27	146.00	409C550A55	146.00	409C571A27	150.65	409C571A55	150.65	
	200 mA	409C550A28	146.00	409C550A56	146.00	409C571A28	150.65	409C571A56	150.65	
	300 mA	409C550A29	146.00	409C550A57	146.00	409C571A29	150.65	409C571A57	150.65	
	500 mA	409C550A30	77.25	409C550A58	77.25	409C571A30	79.55	409C571A58	79.55	
	800 mA	409C550A31	77.25	409C550A59	77.25	409C571A31	79.55	409C571A59	79.55	
Ammeter Radio Frequency Type self-contained square law scale 41 B	1 A	409C549A09	55.25	409C549A43	55.25	409C572A08	57.55	409C572A43	57.55	
	1.5 A	409C549A10	55.25	409C549A44	55.25	409C572A09	57.55	409C572A44	57.55	
	2 A	409C549A11	55.25	409C549A45	55.25	409C572A10	57.55	409C572A45	57.55	
	3 A	409C549A12	55.25	409C549A46	55.25	409C572A11	57.55	409C572A46	57.55	
	5 A	409C549A13	55.25	409C549A47	55.25	409C572A12	57.55	409C572A47	57.55	
	8 A	409C549A14	55.25	409C549A48	55.25	409C572A13	57.55	409C572A48	57.55	
	10 A	409C549A15	55.25	409C549A49	55.25	409C572A14	57.55	409C572A49	57.55	
	15 A	409C549A16	55.25	409C549A50	55.25	409C572A15	57.55	409C572A50	57.55	
	20 A	409C549A17	55.25	409C549A51	55.25	409C572A16	57.55	409C572A51	57.55	
Ammeter Radio Frequency Type self-contained linear expanded scale 42 B	1 A	409C549A21	77.25	409C549A55	77.25	409C572A21	79.55	409C572A55	79.55	
	1.5 A	409C549A22	77.25	409C549A56	77.25	409C572A22	79.55	409C572A56	79.55	
	2 A	409C549A23	77.25	409C549A57	77.25	409C572A23	79.55	409C572A57	79.55	
	3 A	409C549A24	77.25	409C549A58	77.25	409C572A24	79.55	409C572A58	79.55	
	5 A	409C549A25	77.25	409C549A59	77.25	409C572A25	79.55	409C572A59	79.55	
	8 A	409C549A26	77.25	409C549A60	77.25	409C572A26	79.55	409C572A60	79.55	
	10 A	409C549A27	77.25	409C549A61	77.25	409C572A27	79.55	409C572A61	79.55	
	15 A	409C549A28	77.25	409C549A62	77.25	409C572A28	79.55	409C572A62	79.55	
	20 A	409C549A29	77.25	409C549A63	77 25	409C572A29	79.55	409C572A63	79.55	
Ammeter Radio Frequency Type for use with external thermocouple square law scale 43 B	scale to suit thermocouple	409C549A38	46.30	409C549A39	46.30	409C572A38	48.75	409C572A39	48.75	Order thermocouple from section 45.
		Price includes ammeter and one pair of style number 1337 832 five-foot leads. Instrument and thermocouple must be calibrated as a unit to insure accuracy within ±2% of full scale dial marking.								

Most instruments available from stock.

Conventional Panel Instruments

Type.....	RT-351 Rectangular	NT-351 Round	RT-371 Rectangular	NT-371 Round	Notes
Size.....	3½"	3½"	4½"	4½"	
Scale Arc.....	2.4"	2.4"	3.2"	3.2"	
Standard Specification.....	ANSI C39.1	ANSI C39.1	ANSI C39.1	ANSI C39.1	
Accuracy Class.....	2%	2%	2%	2%	





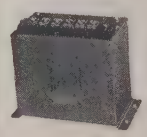
	Rating, Scale	Style No.	List Price	Style No.	List Price	Style No.	List Price	Style No.	List Price	
Ammeter Radio Frequency Type for use with external thermocouple linear expanded scale 44 B	scale to suit thermocouple	409C549A33	$68.30	409C549A34	$68.30	409C572A33	$70.75	409C572A34	$70.75	Order thermocouple from section 72.
		Price includes ammeter and one pair of style number 1337 832 five-foot leads. Instrument and thermocouple must be calibrated as a unit to insure accuracy within ±2% of full scale dial marking.								

External Thermocouples Air Type for Radio Frequency Ammeter 45 B	Rating	Style No.	List Price	Rating	Style No.	List Price
	1 A	878 638	$85.00	10 A	878 647	$ 85.00
	1.5 A	878 639	85.00	15 A	878 648	85.00
	2 A	878 640	85.00	20 A	878 649	85.00
	3 A	878 642	85.00	25 A	878 650	85.00
	5 A	878 644	85.00	30 A	**878 651**	152.00
	8 A	878 646	85.00	50 A	878 654	152.00

	Rating, Scale	Style No.	List Price	Style No.	List Price	Style No.	List Price	Style No.	List Price	
Microammeter Rectifier Type self-contained 25-10,000 Hz 46 A		**RC-351 (3%)**		**NC-351 (3%)**		**RC-371 (3%)**		**NC-371 (3%)**		
	100 uA	409C539A17	$58.00	409C539A37	$58.00	409C566A17	$65.60	409C566A37	$65.60	
	200 uA	409C539A18	54.80	409C539A38	54.80	409C566A18	62.40	409C566A38	62.40	
	500 uA	409C539A19	53.60	409C539A39	53.60	409C566A19	61.20	409C566A39	61.20	
Milliammeter Rectifier Type self-contained 25-10,000 Hz 47 A	1 mA	409C539A09	52.40	409C539A29	52.40	409C566A09	60.00	409C566A29	60.00	
	2 mA	409C539A10	52.40	409C539A30	52.40	409C566A10	60.00	409C566A30	60.00	
	5 mA	409C539A11	52.40	409C539A31	52.40	409C566A11	60.00	409C566A31	60.00	
	10 mA	409C539A12	52.40	409C539A32	52.40	409C566A12	60.00	409C566A32	60.00	
Voltmeter Rectifier Type self-contained 25-10,000 Hz 48 A	3 V	409C535A09	39.40	409C535A33	39.40	409C567A09	44.85	409C567A33	44.85	1,000 ohms per volt.
	5 V	409C535A10	39.40	409C535A34	39.40	409C567A10	44.85	409C567A34	44.85	
	10 V	409C535A11	39.40	409C535A35	39.40	409C567A11	44.85	409C567A35	44.85	
	20 V	409C535A12	39.40	409C535A36	39.40	409C567A12	44.85	409C567A36	44.85	
	50 V	409C535A13	39.40	409C535A37	39.40	409C567A13	44.85	409C567A37	44.85	
	100 V	409C535A14	39.40	409C535A38	39.40	409C567A14	44.85	409C567A38	44.85	
	150 V	**409C535A15**	39.40	409C535A39	39.40	409C567A15	44.85	409C567A39	44.85	
	300 V	409C535A16	39.40	409C535A40	39.40	409C567A16	44.85	409C567A40	44.85	
	600 V	409C535A17	41.70	409C535A41	41.70	409C567A17	47.15	409C567A41	47.15	
Voltmeter Rectifier Type self-contained 25-10,000 Hz 49 A	0.5 V	409C535A21	43.15	409C535A45	43.15	409C567A21	48.60	409C567A45	48.60	5,000 ohms per volt.
	1.0 V	409C535A22	43.15	409C535A46	43.15	409C567A22	48.60	409C567A46	48.60	
	2.0 V	409C535A23	43.15	409C535A47	43.15	409C567A23	48.60	409C567A47	48.60	

Most instruments available from stock.

Conventional Panel Instruments With Separate Serialized Transducer and Motor Load Indicators

	Rating, Scale	RX-351 3½" 2.4" ANSI C39.1 2%		NX-351 3½" 2.4" ANSI C39.1 2%		RX-371 4½" 3.2" ANSI C39.1 2%		NX-371 4½" 3.2" ANSI C39.1 2%		Notes
										Transducer Size: 5¾" x 3" x 4⅞" 
		Style No.	List Price	Style No.	List Price	Style No.	List Price	Style No.	List Price	
Suppressed Zero Voltmeter with VE2-841 transducer 110-130 volts 50 B	25-1000 Hz	**RC-351**		**NC-351**		**RC-371**		**NC-371**		Accuracy 0.4% of mid-scale value. Rms compensated.
		606B247A09	$182.35	606B247A25	$182.35	606B248A09	$184.65	606B248A25	$184.65	
	Dc	606B247A11	195.35	606B247A27	195.35	606B248A11	197.50	606B248A27	197.50	
Motor Load Indicator Ac Ammeter Type 5 amp full scale 0-150% scale 51 A		**3½" RA-351**		**3½" NA-351**		**4½" RA-371**		**4½" NA-371**		Legend "PERCENT MOTOR LOAD." **Type A** has red zone 100-150%. **Type B** has green zone 0-100%, yellow zone 100-125%, and red zone 125-150%.
	Type A	291B280A33	$26.95	291B281A33	$26.95	291B292A37	$32.20	291B293A33	$32.20	
	Type B	**291B280A28**	28.60	**291B281A28**	28.60	**291B292A28**	33.85	291B293A28	33.85	
		Current transformer primary equals motor full load amperes x 1.5.								
Motor Load Indicator Ac Wattmeter Type with VP2-840 transducer 120 volt, 5 amp 0-150% scale 52 B		**3½" RX-351**		**3½" NX-351**		**4½" RX-371**		**4½" NX-371**		For use with variable ratio current transformer (doughnut type) Current transformers not included. For calibration in actual motor horsepower, specify current transformer ratio and watts or current and power factor at 5/4, 4/4, 3/4, and 1/2 load. Add $19.25. A single phase wattmeter may be used in a reversed lead connection through a doughnut transformer to measure three phase motor load.
	1 ph, Type A	715B355A09	188.75	715B355A25	188.75	715B356A09	190.35	715B356A25	190.35	
	1 ph, Type B	715B355A10	192.75	715B355A26	192.75	715B356A10	194.35	715B356A26	194.35	
	3 ph, 3 w, Type A	715B355A11	253.75	715B355A27	253.75	715B356A11	255.35	715B356A27	255.35	
	3 ph, 4 w, Type B	715B355A12	285.75	715B355A28	285.75	715B356A12	287.35	715B356A28	287.35	
		Single phase indicators are calibrated to 500 watts secondary full scale. Three phase indicators to 1,000 watts. Current transformer primaries are calculated to develop calibrated watts at 150% of motor full load. When single ratio current transformers are used the transducer must be calibrated to a specific full scale watts. Specify full scale watts input to transducer or specify current and potential transformer ratio along with full motor performance data. Add $19.25. For 240 volts or for 480 volts, single phase wattmeters only, consult factory for price.									
Motor Load Indicator Ac In-Phase Current Type 5 amp full scale 240/480 volts 0-150% scale 53 A						**4½" RC-371**		**4½" NC-371**		
	Type A					291B331A23	143.40	291B331A12	143.40	
	Type B					291B331A24	144.45	291B331A13	144.45	
	Special 0-160%					**291B331A22**	143.40	291B331A11	143.40	
		Calibrated for average motor performance. Current transformer primary equals motor full load amperes x 1.5. Power factor .86 at full load.								
Motor Load Indicator Dc Ammeter Type 50 Mv full scale 0-150% scale 54 A		**3½" RX-351**		**3½" NX-351**		**4½" RX-371**		**4½" NX-371**		
	Type A	715B353A09	29.70	715B353A25	29.70	715B354A09	34.95	715B354A25	34.95	
	Type B	715B353A10	31.35	715B353A26	31.35	715B354A10	36.60	715B354A26	36.60	
		When available 50 mV shunt ratings do not match 150% of motor full load current within the desired accuracy limits, a 100 mV shunt with a series resistor should be used. Otherwise an intermediate rating millivoltmeter may be ordered. Consult factory for pricing.								

Most instruments available from stock.

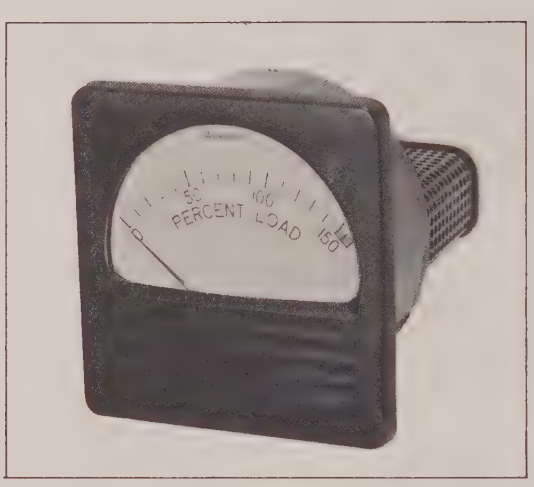
Conventional Panel Instruments With Separate Serialized Transducer

	Rating, Scale	Style No.	List Price	Style No.	List Price	Style No.	List Price	Style No.	List Price	Notes
Resistance Thermometer RTD Type with VT2-841 transducer 120 volt, 60 Hz 55 B		**3½" RX-351**		**3½" NX-351**		**4½" RX-371**		**4½" NX-371**		For use with copper temperature detector coils, 10 ohms at 25°C. (Not furnished.)
	0-100°C	715B316A09	$255.75	715B316A25	$255.75	715B318A09	$257.35	715B318A25	$257.35	
	0-150°C	715B316A10	255.75	715B316A26	255.75	715B218A10	257.35	715B318A26	257.35	
	0-200°C	715B316A11	255.75	715B316A27	255.75	715B318A11	257.35	715B318A27	257.35	
Ac Wattmeter with VP2-840 transducer 5 amp, 120 volt 56 B	1 ph, 60 Hz	606B223A09	188.75	606B223A23	188.75	606B224A09	190.35	606B224A23	190.35	Listed styles have preferred scales listed on page 26-27. For any other rating between 0.5 and 10 amperes, order similar to these styles. For prices consult factory.
	3 ph, 3 w, 60 Hz	606B223A13	255.75	606B223A27	255.75	606B224A13	257.75	606B224A27	257.75	
	3 ph, 4 w, 60 Hz	606B223A17	285.75	606B223A31	285.75	606B224A17	287.35	606B224A31	287.35	
	1 ph, 400 Hz	606B223A10	202.75	606B223A24	202.75	606B224A10	204.35	606B224A24	204.35	
	3 ph, 3 w, 400 Hz	606B223A14	216.75	606B223A28	216.75	606B224A14	218.35	606B224A28	218.35	
	3 ph, 4 w, 400 Hz	606B223A18	299.75	606B223A32	299.75	606B224A18	301.35	606B224A32	301.35	
AC Varmeter with VV2-840 transducer 5 amp, 120 volt 57 B	1 ph, 60 Hz	606B223A11	233.75	606B223A25	233.75	606B224A11	235.35	606B224A25	235.35	For 240 volts consult factory. For 480 volts, single phase wattmeters only, , consult factory. **Specify current transformer and potential transformer connections and ratios as well as scale marking.**
	3 ph, 3 w, 60 Hz	606B223A15	293.75	606B223A29	293.75	606B224A15	295.35	606B224A29	295.35	
	3 ph, 4 w, 60 Hz	606B223A19	323.75	606B223A33	323.75	606B224A19	325.35	606B224A33	325.35	
	1 ph, 400 Hz	606B223A12	247.75	606B223A26	247.75	606B224A12	249.35	606B224A26	249.35	
	3 ph, 3 w, 400 Hz	606B223A16	307.75	606B223A30	307.75	606B224A16	309.35	606B224A30	309.35	
	3 ph, 4 w, 400 Hz	606B223A20	337.75	606B223A34	337.75	606B224A20	339.35	606B224A34	339.35	
Frequency Meter with VC2-841 transducer 120 volt 58 B	55-65	671B253A11	226.75	671B253A27	226.75	**671B255A11**	228.35	671B255A27	228.35	Accuracy ±2% of span. For 240 volts, add $19.25.
	50-70	671B253A12	226.75	671B253A28	226.75	671B255A12	228.35	671B255A28	228.35	
	45-55	671B253A13	240.75	671B253A29	240.75	671B255A13	242.35	671B255A29	242.35	
	45-65	671B253A15	240.75	671B253A31	240.75	671B255A15	242.35	671B255A31	242.35	
	350-450	671B253A18	240.75	671B253A34	240.75	671B255A18	242.35	671B255A34	242.35	
Power Factor Meter with VF2-841 transducer 120 volt 50-100-50% 59 B	1 ph	714B508A09	240.75	714B508A25	240.75	714B509A09	242.35	714B509A25	242.35	Accuracy 3% from 1 to 2 amps, 2% from 2 to 5 amps. For 240 volts or 3 phase 208 volts, add $19.25.
	3 ph, 3 w	714B508A11	226.75	714B508A27	226.75	714B509A11	228.35	714B509A27	228.35	
	3 ph, 4 w, (120/208Y)	714B508A13	240.75	714B508A29	240.75	714B509A13	242.35	714B509A29	242.35	

Most instruments available from stock.

C-371 Motor Load Indicator Panel Instrument

4½ Inch Class



Motor Load Indicator		4½" RC-371		4½" NC-371	
Ac In-Phase Current Type	Type A	291B331A23	143.40	291B331A12	143.40
	Type B	291B331A24	144.45	291B331A13	144.45
5 amp full scale 240/480 volts 0-150% scale	Special 0-160%	**291B331A22**	143.40	291B331A11	143.40

These prices are also printed in Section 53, Page 20.

DESCRIPTION

The motor load indicator measures I cos θ, therefore with a constant voltage the deflection is proportional to power (EI cos θ). Using the above mechanism and a fixed line voltage, power is measured by this instrument. At 150% load, induction motors have a power factor of approximately .86. The motor current must be transformed by an external current transformer (placed in phase B) of such ratio to produce 5 amperes secondary current when the P.F. is .86 at 150% load. The full scale indication is 160%. If the power factor is other than .86 at 150% load, the C.T. ratio must be chosen to give I line x P.F. = 4.33 amps x C.T. ratio.

Two 82,000 ohm resistors are wired in series in both the "A" and "C" phases — see schematic wiring diagram. These resistors are matched within 1000 ohms of each other thus permitting interchange of the "A" and "C" phase connections without effecting the indicated accuracy.

The meter is calibrated for voltage ranges of 240 and 480 volts, and can be used over the ranges listed below. Two resistor shunting links are assembled on the resistor assembly and are accessible for range changing when the resistor cage cover is removed. The use of the resistor shunting links permits 190-280 volt operation. The removal of the links increases the voltage rating to 350-550 volts.

CASES

The motor load indicator is housed in a flush mounted, black molded phenolic case and may have either a 4 inch square of a 4½ inch round mounting flange.

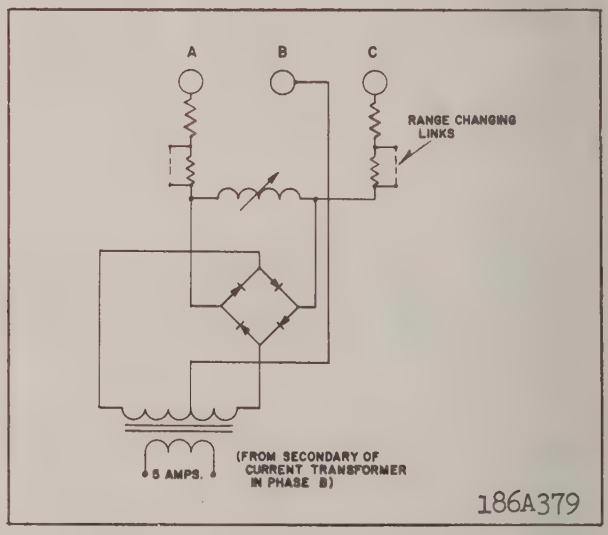
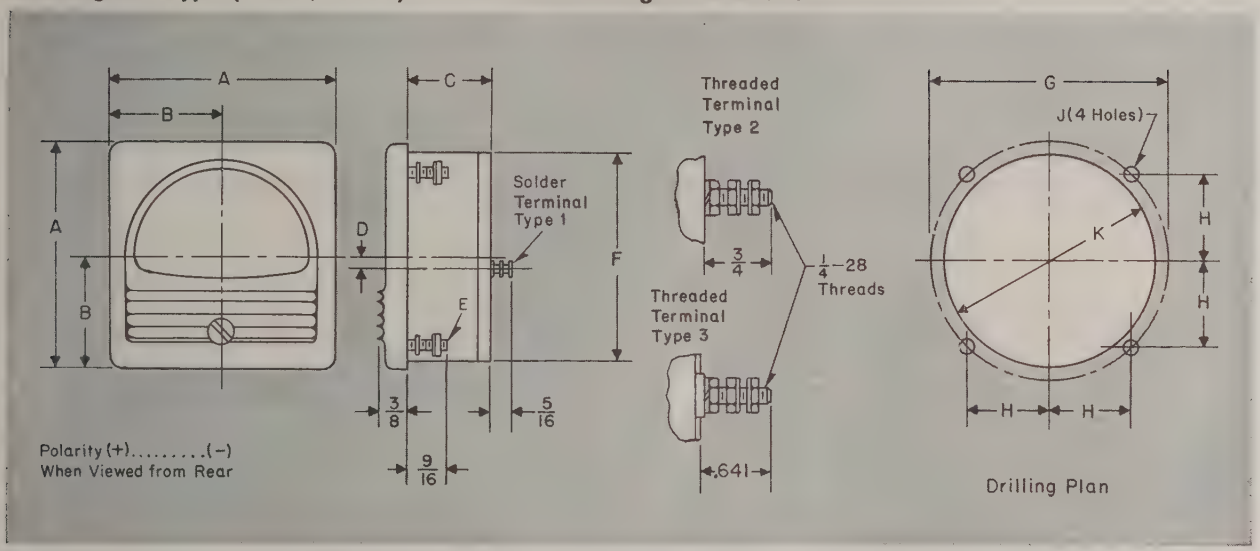


Fig. 1 – Schematic Wiring Diagram

MECHANISM

The mechanism consists of an internally mounted transformer, a ring modulator, series resistors mounted externally on the rear of the base and a permanent magnet moving-coil mechanism.

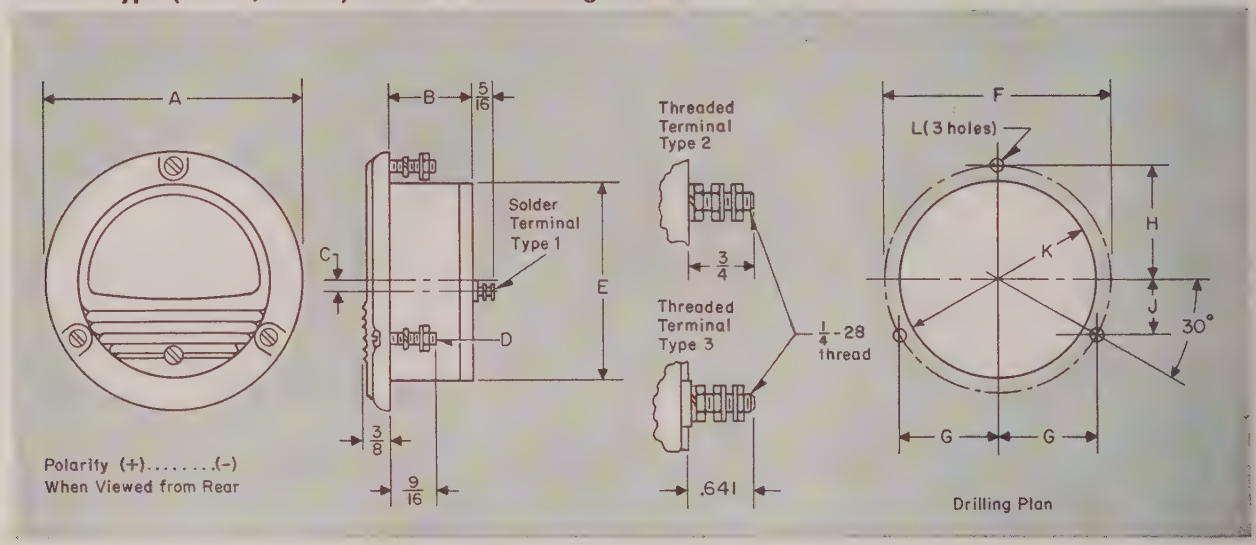
Rectangular Type (R-351, R-371) Outline and Drilling Dimensions



Type	Instrument	Standard Terminal ①②	Dimension in Inches A	B	C	D	E (Thread Size)	F	G	H	J (Dia.)	K
RA-351	Ac Voltmeters, Ac Milliammeters, and Ac Ammeters through 20 Amps	Threaded Type 2	3	1½	1 19/32	.170③	.112-40 (4-40)	2.795	3.182	1⅛	⅛	2 13/16
RA-351	Ac Ammeters 30 through 50 Amps	Threaded Type 3	3	1½	1⅝	.170③	.112-40 (4-40)	2.795	3.182	1⅛	⅛	2 13/16
RC-351, RX-351	All (Except Dc Millivoltmeters and Self-Contained Dc Ammeters Above 10 Amps)	Threaded Type 2	3	1½	1⅛	.156③	.112-40 (4-40)	2.795	3.182	1⅛	⅛	2 13/16
RT-351	All Thermocouple Types	Threaded Type 2	3	1½	1¼	.156③	.112-40 (4-40)	2.795	3.182	1⅛	⅛	2 13/16
RX-351	Dc Millivoltmeters and Self-Contained Above 10 Amps	Threaded Type 2	3	1½	1⅛	.156③	.112-40 (4-40)	2.795	3.182	1⅛	⅛	2 13/16
RX-371	All (Except Dc Millivoltmeters and Self-Contained Dc Ammeters Above 10 Amps)	Threaded Type 2	3 31/32	1 53/64	1½	.156④	.138-32 (6-32)	3 25/32	4.240	1½	3/16	3 13/16
RA-371, RT-371	All	Threaded Type 2	3 31/32	1 53/64	1½	.156④	.138-32 (6-32)	3 25/32	4.240	1½	3/16	3 13/16
RX-371	Dc Millivoltmeters and Self-Contained Dc Ammeters Above 10 Amps	Threaded Type 2	3 31/32	1 53/64	1½	.156④	.138-32 (6-32)	3 25/32	4.240	1½	3/16	3 13/16

① All terminals are spaced ½ inch on each side of vertical centerline.
② Type 1 solder terminals are available on special order.
③ Terminals located above centerline.
④ Terminals located below centerline.

Round Type (N-351, N-371) Outline and Drilling Dimensions



Type	Instrument	Standard Terminal ①②	Dimension in Inches A	B	C	D (Thread Size)	E	F	G	H	J	K	L (Dia.)
NA-351	Ac Voltmeters, Ac Milliammeters, and Ac Ammeters through 20 Amps	Threaded Type 2	3½	1 19/32	.170③	.138-32 (6-32)	2.795	3.160	1.368	1.580	.790	2 13/16	.150
NA-351	Ac Ammeters 30 through 50 Amps	Threaded Type 3	3½	1⅝	.170③	.138-32 (6-32)	2.795	3.160	1.368	1.580	.790	2 13/16	.150
NC-351, NX-351	All (Except Dc Millivoltmeters and Self-Contained Dc Ammeters Above 10 Amps)	Threaded Type 2	3½	1⅛	.156③	.138-32 (6-32)	2.795	3.160	1.368	1.580	.790	2 13/16	.150
NT-351	All Thermocouple Types	Threaded Type 2	3½	1¼	.156③	.138-32 (6-32)	2.795	3.160	1.368	1.580	.790	2 13/16	.150
NX-351	Dc Millivoltmeters and Self-Contained Ammeters Above 10 Amps	Threaded Type 2	3½	1⅛	.156③	.138-32 (6-32)	2.795	3.160	1.368	1.580	.790	2 13/16	.150
NX-371	All (Except Dc Milliammeters and Self-Contained Dc Ammeters Above 10 Amps)	Threaded Type 2	4.562	1½	.156④	.164-32 (8-32)	3 25/32	4.126	1.786	2.063	1.032	3 13/16	3/16
NA-371, NT-371	All	Threaded Type 2	4.562	1½	.156④	.164-32 (8-32)	3 25/32	4.126	1.786	2.063	1.032	3 13/16	3/16
NX-371	Dc Millivoltmeters and Self-Contained Dc Ammeters Above 10 Amps	Threaded Type 2	4.562	1½	.156④	.164-32 (8-32)	3 25/32	4.126	1.786	2.063	1.032	3 13/16	3/16

① All terminals are spaced ½-inch on each side of vertical centerline.
② Type 1 solder terminals are available on special order only.
③ Terminals located above centerline.
④ Terminals located below centerline.

Ratings, Mechanisms, and Accuracy

Instrument	Case and Type 3½"	Case and Type 4½"	Range	Mechanism	Accuracy
Dc Microammeters	RX, NX 351	RX, NX 371	20–800	Permanent-Magnet Moving-Coil	±2%
Dc Milliammeters	RX, NX 351	RX, NX 371	1–800	Permanent-Magnet Moving-Coil	±2%
Dc Ammeters, Self-Contained	RX, NX 351	RX, NX 371	1–50	Permanent-Magnet Moving-Coil	±2%
Dc Ammeters, Shunt Type	RX, NX 351	RX, NX 371	15–1000	Permanent-Magnet Moving-Coil	±2%
Dc Millivoltmeters	RX, NX 351	RX, NX 371	50–500	Permanent-Magnet Moving-Coil	±2%
Dc Voltmeters	RX, NX 351	RX, NX 371	1–800	Permanent-Magnet Moving-Coil	±2%
Ac Milliammeters	RA, NA 351	RA, NA 371	5–500	Moving Iron	±2%
Ac Ammeters, Self-Contained	RA, NA 351	RA, NA 371	1–50	Moving Iron	±2%
Ac Ammeters, Transformer Type	RA, NA 351	RA, NA 371	20–3000	Moving Iron	±2%
Ac Voltmeters	RA, NA 351	RA, NA 371	1.5–800	Moving Iron	±2%
Rectifier Microammeters	RC, NC 351	RC, NC 371	100–500	Rectifier with Permanent-Magnet Moving-Coil	±3%
Rectifier Milliammeters	RC, NC 351	RC, NC 371	1–10	Rectifier with Permanent-Magnet Moving-Coil	±3%
Rectifier Voltmeters	RC, NC 351	RC, NC 371	.5–600	Rectifier with Permanent-Magnet Moving-Coil	±3%
Radio Frequency Milliammeters①	RT, NT 351	RT, NT 371	10–800	Permanent-Magnet Moving-Coil	±2%
Radio Frequency Ammeters, Self-Contained①	RT, NT 351	RT, NT 371	1–20	Permanent-Magnet Moving-Coil	±2%
Radio Frequency Ammeters, Thermocouple Type①	RT, NT 351	RT, NT 371	.....	Thermocouple with Permanent-Magnet Moving-Coil	±2%
Frequency Meters	RX, NX 351	RX, NX 371	50–60 Cy.	Permanent-Magnet Moving-Coil	±2%
Wattmeters	RX, NX 351	RX, NX 371	{1–10 A / 120–480 V}	Permanent-Magnet Moving-Coil	±2%
Varmeters	RX, NX 351	RX, NX 371	{1–10 A / 120–480 V}	Permanent-Magnet Moving-Coil	±2%
Motor Load Indicators, Ammeter Type	RA, NA 351	RA, NA 371	5 A	Moving Iron	±2%
Motor Load Indicators, Wattmeter Type	RA, NA 351	RA, NA 371	.1–10 A	Moving Iron	±2%
Motor Load Indicators, In-Phase Current Type	.....	RX 371	5 A	Permanent-Magnet Moving-Coil	±2%
Motor Load Indicators, Dc Ammeter Type	RX, NX-351	RX, NX-371	50 Mv	Permanent-Magnet Moving-Coil	±2%
Ac Wattmeter with External Transducer (VP2-840)	RX, NX-351	RX, NX-371	5 A, 120 V	Permanent-Magnet Moving-Coil	±2%
Ac Varmeter with External Transducer (VV2-840)	RX, NX-351	RX, NX-371	5 A, 120 V	Permanent-Magnet Moving-Coil	±2%
Frequency Meter with External Transducer (VC2-841)	RX, NX-351	RX, NX-371	60, 400 Hz	Permanent-Magnet Moving-Coil	±2%
Power Factor Meter with External Transducer (VF2-841)	RX, NX-351	RX, NX-371	5 A, 120 V	Permanent-Magnet Moving-Coil	±2%
Suppressed Zero Voltmeter with External Transducer (VE2-841)	RC, NC-351	RC, NC-371	110-130 V	Permanent-Magnet Moving-Coil	±2%
Thermometer with External Transducer (VT2-841)	RX, NX-351	RC, NC-371	0-200°C	Permanent-Magnet Moving-Coil	±2%

① Scales per FCC 73.39

Scale Selector Chart Wattmeters and Varmeters

Current Transformer Ratio			System Voltage 120	240	480	600	2400	4200	4800
			Potential Transformer Ratio None	2/1	4/1	5/1	20/1	35/1	40/1
Single Phase 2-Wire **Single Phase Test Range: 400-625 Watts**									
25/5	Min	K	2	4	8	10	40	70	80
	Nom		**2.5**	**5**	**10**	**12**	**50**	**90**	**100**
	Max		3	6	12	15	60	100	120
50/5	Min	I	4	8	16	20	80	150	160
	Nom		**5**	**10**	**20**	**25**	**100**	**175**	**200**
	Max		6	12	25	30	120	200	250
75/5	Min	L	6	12	25	30	120	250	250
	Nom		**7.5**	**15**	**30**	**40**	**150**	**250**	**300**
	Max		9	18	35	45	180	300	350
100/5	Min	O	8	16	35	40	160	300	350
	Nom		**10**	**20**	**40**	**50**	**200**	**350**	**400**
	Max		12	25	50	60	250	400	500
150/5	Min	W	12	25	50	60	250	450	500
	Nom		**15**	**30**	**60**	**75**	**300**	**500**	**600**
	Max		18	35	75	90	350	650	750
200/5	Min	A	16	35	65	80	350	600	650
	Nom		**20**	**40**	**80**	**100**	**400**	**700**	**800**
	Max		25	50	100	120	500	800	1000
300/5	Min	T	25	50	100	120	500	900	1000
	Nom		**30**	**60**	**120**	**150**	**600**	**1000**	**1200**
	Max		35	75	150	180	750	1200	1500
400/5	Min	T	35	65	150	160	650	1200	1500
	Nom		**40**	**80**	**160**	**200**	**800**	**1500**	**1600**
	Max		50	100	200	250	1000	1750	2000
600/5	Min	S	50	100	200	250	1000	1750	2000
	Nom		**60**	**120**	**250**	**300**	**1200**	**2000**	**2500**
	Max		75	150	300	350	1500	2500	3000
800/5	Min		65	150	300	350	1500	2500	3000
	Nom		**80**	**160**	**300**	**400**	**1600**	**3000**	**3000**
	Max		100	200	400	500	2000	3500	4000
1200/5	Min		100	200	400	500	2000	3500	4000
	Nom		**120**	**250**	**500**	**600**	**2500**	**4000**	**5000**
	Max		150	300	600	750	3000	5000	6000
1500/5	Min		120	250	500	600	2500	4500	5000
	Nom		**150**	**300**	**600**	**750**	**3000**	**5000**	**6000**
	Max		180	350	750	900	3500	6500	7500
2000/5	Min		160	350	650	800	3500	6000	6500
	Nom		**200**	**400**	**800**	**1000**	**4000**	**7000**	**8000**
	Max		250	500	1000	1200	5000	8000	**10MW**
3000/5	Min		250	500	1000	1200	5000	9000	10
	Nom		**300**	**600**	**1200**	**1500**	**6000**	**10MW**	**12**
	Max		350	750	1500	1800	7500	12	15

MEGAWATTS

Preferred Ratings Wattmeters and Varmeters

In the interest of standardization of preferred wattmeter and varmeter scale markings for the common current and potential transformers a listing appears on this page. Such instruments may be supplied with left zero or center zero scales at the same list price.

Since wattmeter and varmeter current circuits are frequently connected in series, they should have equal current ratings. This means that extreme care should be taken when different scale ranges are selected for the wattmeter and varmeter connected to the same current and potential transformers. If the wattmeter with a nominal preferred left zero scale value is selected (0-100 kw), a varmeter with a center zero (50-0-50 kvar) or offset zero (20-0-80 kvar) can be supplied if the sum of the end scale values does not exceed the wattmeter scale value.

Scales outside the preferred ranges are available at an extra price for any current transformer secondary between 0.5 and 10 amps at full scale.

Scales 1000 kw and over are marked in megawatts.

Scale Selector Chart Wattmeters and Varmeters

2 Current Coil 3-Phase 3-Wire

Single Phase Test Range: 400-625 Watts

Current Transformer Ratio			System Voltage 120	240	480	600	2400	4200	4800
			Potential Transformer Ratio None	2/1	4/1	5/1	20/1	35/1	40/1
25/5	Min	KILOWATTS	4	8	16	20	80	150	160
	Nom		**5**	**10**	**20**	**25**	**100**	**175**	**200**
	Max		6	12	25	30	120	200	250
50/5	Min		8	16	35	40	160	300	350
	Nom		**10**	**20**	**40**	**50**	**200**	**350**	**400**
	Max		12	25	50	60	250	400	500
75/5	Min		12	25	50	60	250	450	500
	Nom		**15**	**30**	**60**	**75**	**300**	**500**	**600**
	Max		18	35	75	90	350	650	750
100/5	Min		16	35	70	80	350	600	700
	Nom		**30**	**40**	**80**	**100**	**400**	**700**	**800**
	Max		25	50	100	125	500	800	1000
150/5	Min		25	50	100	120	500	900	1000
	Nom		**30**	**60**	**120**	**150**	**600**	**1000**	**1200**
	Max		35	75	150	180	750	1200	1500
200/5	Min		35	65	150	160	650	1200	1500
	Nom		**40**	**80**	**150**	**200**	**800**	**1500**	**1500**
	Max		50	100	200	250	1000	1750	2000
300/5	Min		50	100	200	250	1000	1750	2000
	Nom		**60**	**120**	**250**	**300**	**1200**	**2000**	**2500**
	Max		75	150	300	350	1500	2500	3000
400/5	Min		65	150	300	350	1500	2500	3000
	Nom		**80**	**150**	**300**	**400**	**1500**	**3000**	**3000**
	Max		100	200	400	500	2000	3500	4000
600/5	Min		100	200	400	500	2000	3500	4000
	Nom		**120**	**250**	**500**	**600**	**2500**	**4000**	**5000**
	Max		150	300	600	750	3000	5000	6000
800/5	Min		150	300	600	650	3000	4500	6000
	Nom		**150**	**300**	**600**	**800**	**3000**	**5000**	**6000**
	Max		200	400	800	1000	4000	7000	8000
1200/5	Min		200	400	800	1000	4000	7000	8000
	Nom		**250**	**500**	**1000**	**1200**	**5000**	**8000**	**10MW**
	Max		300	600	1200	1500	6000	10MW	12
1500/5	Min		250	500	1000	1200	5000	9000	10
	Nom		**300**	**600**	**1200**	**1500**	**6000**	**10MW**	**12**
	Max		350	750	1500	1800	7500	12	15
2000/5	Min		350	650	1500	1600	6500	12	15
	Nom		**400**	**800**	**1500**	**2000**	**8000**	**15**	**15**
	Max		500	1000	2000	2500	10MW	17.5	20
3000/5	Min		500	1000	2000	2500	10	17.5	20
	Nom		**600**	**1200**	**2500**	**3000**	**12**	**20**	**25**
	Max		750	1500	3000	3500	15	25	30

MEGAWATTS

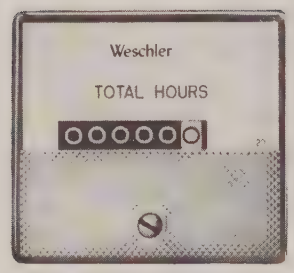
3 Current Coil 3-Phase 4-Wire

Single Phase Test Range: 313 to 521 Watts

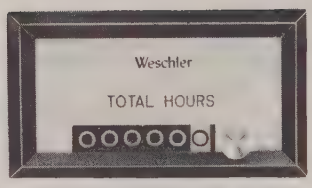
Current Transformer Ratio			System Voltage 208	480	4160	7274	8320
			Line to Neutral 120	277	2400	4200	4800
			Potential Transformer Ratio None	2.4/1	20/1	35/1	40/1
25/5	Min	KILOWATTS	7	15	125	250	250
	Nom		**8**	**17.5**	**150**	**300**	**300**
	Max		10	20	200	350	400
50/5	Min		15	30	250	450	500
	Nom		**17.5**	**35**	**300**	**600**	**600**
	Max		20	45	400	700	800
75/5	Min		20	45	400	700	750
	Nom		**25**	**65**	**500**	**800**	**1000**
	Max		30	70	600	1000	1200
100/5	Min		25	60	500	900	1000
	Nom		**35**	**70**	**600**	**1200**	**1200**
	Max		40	90	800	1200	1600
150/5	Min		40	90	750	1500	1500
	Nom		**50**	**100**	**1000**	**1750**	**2000**
	Max		60	120	1200	2000	2500
200/5	Min		50	120	1000	1750	2000
	Nom		**70**	**150**	**1200**	**2500**	**2500**
	Max		80	180	1600	2500	3000
300/5	Min		75	175	1500	3000	3000
	Nom		**100**	**200**	**2000**	**3500**	**4000**
	Max		120	250	2500	4000	5000
400/5	Min		100	250	2000	3500	4000
	Nom		**120**	**300**	**2500**	**4500**	**5000**
	Max		160	350	3000	5000	6000
600/5	Min		150	350	3000	6000	6000
	Nom		**200**	**450**	**4000**	**7000**	**8000**
	Max		250	500	5000	8000	10MW
800/5	Min		200	500	4000	7000	8000
	Nom		**250**	**600**	**5000**	**9000**	**10MW**
	Max		300	750	6500	10MW	12
1200/5	Min		300	700	6000	12	12
	Nom		**400**	**800**	**7500**	**15**	**15**
	Max		500	1000	10MW	17.5	20
1500/5	Min		400	900	7500	15	15
	Nom		**500**	**1000**	**10MW**	**17.5**	**20**
	Max		600	1200	12	20	25
2000/5	Min		500	1200	10	17.5	20
	Nom		**700**	**1500**	**12**	**25**	**25**
	Max		800	1800	16	25	30
3000/5	Min		750	1750	15	30	30
	Nom		**1000**	**2000**	**20**	**35**	**40**
	Max		1200	2500	25	40	50

MEGAWATTS

Type GH-332



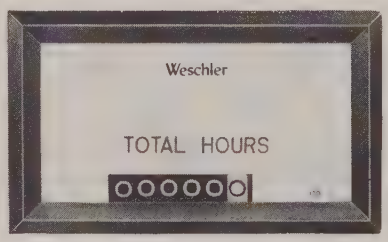
Front of Panel Mounting (Without Reset)



With Bezel for Rear of Panel Mounting (With Reset)

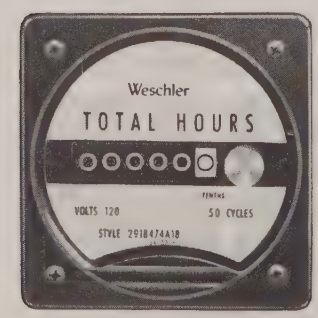
Type GH-352

Front of Panel Mounting (With Reset)

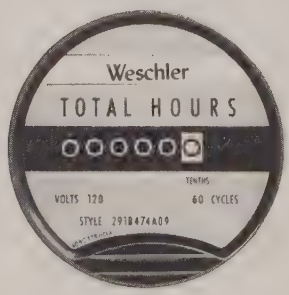


With Bezel for Rear of Panel Mounting (Without Reset)

Type BH-351



Front of Panel Mounting (With Reset)



Rear of Panel Mounting (Without Reset)

Application

Weschler GH and BH elapsed time meters indicate the total time that a particular circuit is energized. They are used for maintenance scheduling of electrical equipment (including diesel generators, motors, welders, and radio and television transmitters) and tube replacement programs.

Each consists of synchronous motor and cyclometer type register. When energized by the circuit being monitored, the motor drives the register (which has six digit wheels) to indicate up to 99,999.9 hours or minutes as a highly visible numerical strip across the center of the dial.

BH-351 meters are housed in an attractive molded case and diecast cover assembly which matches the appearance of Weschler conventional panel instruments. They can be mounted from either the front or back of the panel, and are available with or without reset knob.

Type GH-332 and GH-352 meters have a similar mechanism housed in a thermosetting case with a clear acrylic plastic cover. They are identical in appearance with Weschler 20/20 custom panel instruments. They harmonize with most other modern panel mounted components. A bezel kit is used for rear-of-panel mounting. The bezel mounted meters may be illuminated from behind the panel.

Specifications

Insulation Rating: working voltage to ground–1100v.
Range: 0-99,999.9 hours or minutes
Net Weight: 1 pound
Shipping Weight: 2 pounds

Available Ratings

Register Indication	Volts	Frequency: Hertz
0-99,999.9 hours	120	50
0-99,999.9 hours	120	60
0-99,999.9 hours	240	60
0-99,999.9 hours	480	60
0-99,999.9 minutes	120	60

Elapsed Time Meters

Elapsed Time

60 A

Type..... GH-332
Size..... 2½″

Front-of-Panel Mounting

Rear-of-Panel Mounting

GH-352
3½″

Front-of-Panel Mounting

Rear-of-Panel Mounting

BH-351
3½″

Front-of-Panel Mounting

Rear-of-Panel Mounting

Description	Rating	GH-332 Style Number	GH-332 List Price	GH-352 Style Number	GH-352 List Price	BH-351 Style Number	BH-351 List Price
Total Hours Non-Reset Type	120 volts, 60 Hz	**671B375A09**	$31.85	**671B376A09**	$31.85	**291B474A09**	$36.15
	240 volts, 60 Hz①	**671B375A10**	33.20	**671B376A10**	33.20	**291B474A11**	37.45
	480 volts, 60 Hz	**671B375A11**	35.05	**671B376A11**	35.05	291B474A12	39.35
0-99,999.9 Hours	120 volts, 50 Hz	671B375A12	35.05	**671B376A12**	35.05	**291B474A10**	39.35
Total Minutes Non-Reset Type	120 volts, 60 Hz	**671B375A13**	31.85	**671B376A13**	31.85	**291B927A09**	36.15
	240 volts, 60 Hz①	671B375A14	32.30	671B376A14	32.30	.....	.....
	480 volts, 60 Hz	671B375A15	35.05	671B376A15	35.05	.....	.....
0-99,999.9 Minutes							
Total Hours Reset Type	120 volts, 60 Hz	**671B375A25**	43.10	**671B376A25**	43.10	**291B474A17**	47.35
	240 volts, 60 Hz①	671B375A26	44.70	**671B376A26**	44.70	291B474A19	48.95
	480 volts, 60 Hz	**671B375A27**	46.30	**671B376A27**	46.30	291B474A20	50.55
0-99,999.9 Hours	120 volts, 50 Hz	671B375A28	46.30	671B376A28	46.30	291B474A18	50.55
Total Minutes Reset Type	120 volts, 60 Hz	**671B375A29**	43.10	**671B376A29**	43.10	291B927A21	47.35
	240 volts, 60 Hz①	671B375A30	44.70	671B376A30	44.70	.....	.....
	480 volts, 60 Hz	671B375A31	46.30	671B376A31	46.30	.....	.....
0-99,999.9 Minutes							

Notes

Type BH-351 may be mounted in front or rear of panel without special fittings.

For rear-of-panel mounting type, order listed style number "with rear-of-panel" mounting. Weschler will ship a standard listed style at its regular price and will provide a sub-item for the bezel at the prices shown and described as:

For Type GH-332:
Bezel Style No.
292B767G04
List Price . . $3.00

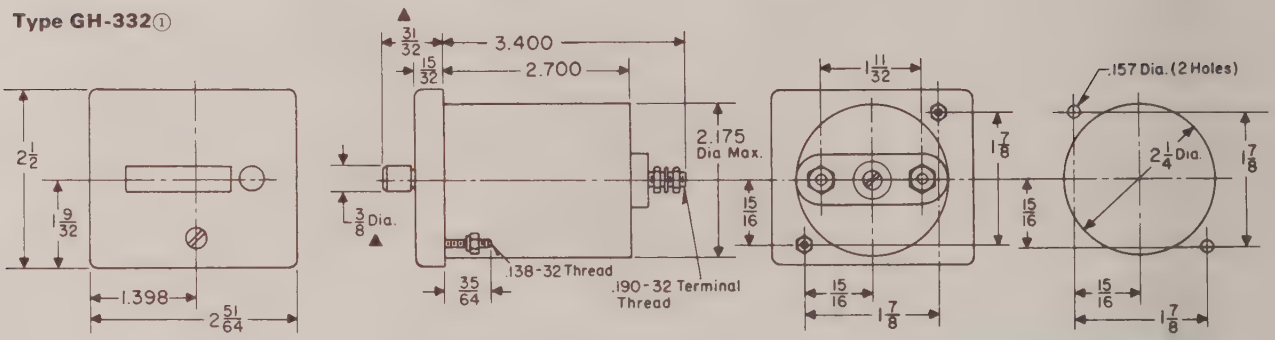
For Type GH-352:
Bezel Style No.
292B767G02
List Price . . $3.25

① 240 volt units may be operated at 208 volts.

Most instruments available from stock.

Elapsed Time Meters–Outline Dimensions And Drilling Plans In Inches

Type GH-332①

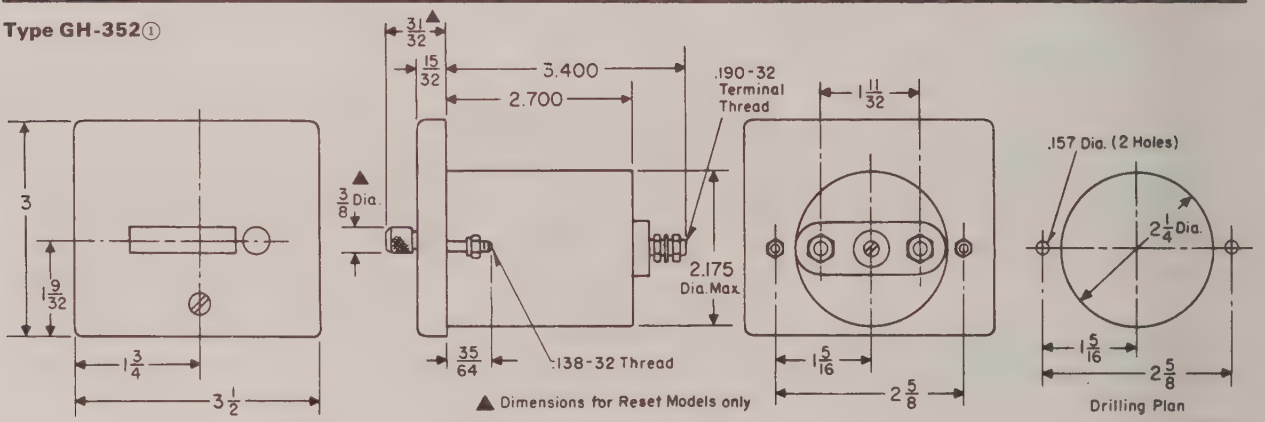


▲ Dimensions for Reset Model only

Drilling Plan

899C222

Type GH-352①

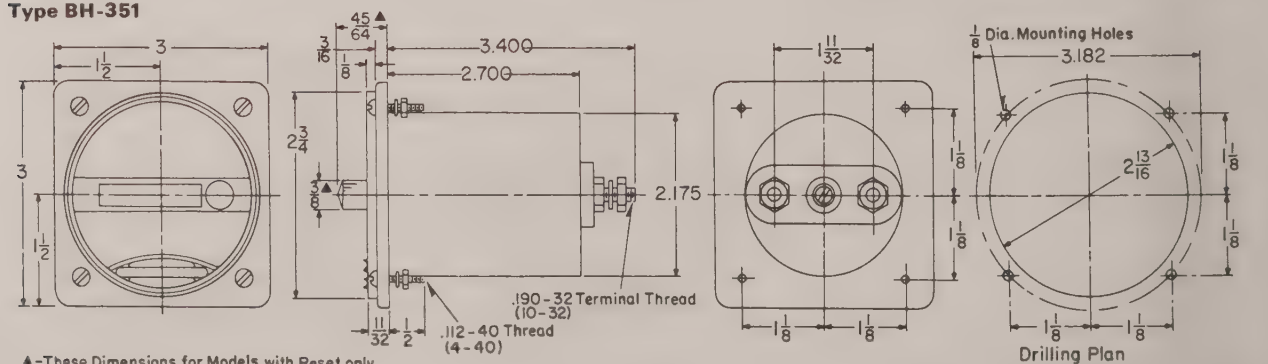


▲ Dimensions for Reset Models only

Drilling Plan

899C223

Type BH-351



▲–These Dimensions for Models with Reset only

Drilling Plan
(For Both Front of Panel and Back of Panel Mtg.)

409C791

① GH-332 and GH-352 bezel mounting is same as equivalent 20/20 types.

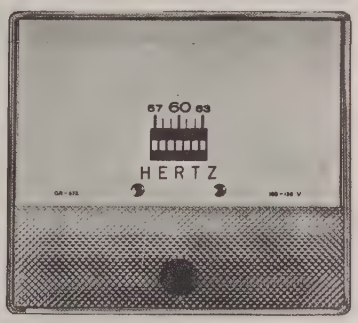
Vibrating Reed Frequency Meters

Front of Panel Mounting

GR-332

GR-352

GR-372

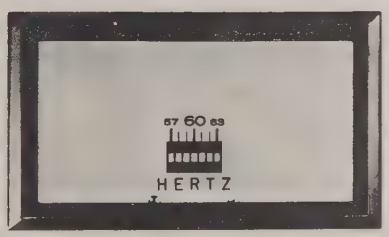


With Bezel for Rear of Panel Mounting

GR-332

GR-352

GR-372



Application

Type GR vibrating-reed frequency meters are used primarily on small engine-generator sets where function does not require, nor economics allow, the use of a continuously indicating analog type frequency meter. (See Type 20/20 frequency meters, transducer type, Price List 43-300.)

The Type GR mechanism consists of seven tuned steel reeds located within a magnetic field pulsing at the frequency being measured. The reeds are tuned to resonate progressively in increments of one vibration per second between 57 and 63 vps. They will vibrate in varying amplitudes when excited by the pulsing magnetic field, with that reed in resonance having much the greater amplitude.

Readings of electrical frequency are made by observing the pattern of the ends of the reeds within the instrument window.

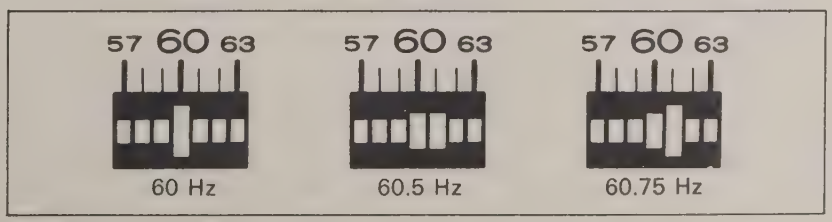


Figure 1

Type GR meters are housed on a thermosetting plastic case with a clear acrylic cover. They are identical in appearance with Weschler Type 20/20 custom panel instruments, and with Type GH elapsed time meters. They harmonize with most other modern panel mounted components. A bezel kit is used for rear of panel mounting. The bezel mounted meters may be illuminated from behind the panel.

Specifications

Range: . . . . . 57-60-63 hertz.

Input: . . . . . 100-130 volts, 60 hertz.

Loss: . . . . . 1 watt.

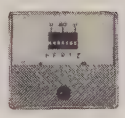
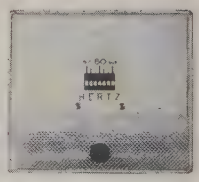
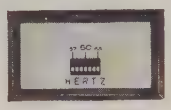
Insulation Rating: . . . . . 1100 volts peak. working voltage to ground

Accuracy: . . . . . ±0.18 hertz at 77°F.

Weight: . . . . . 6-9 ounces.

Vibrating Reed Frequency Meters

61A

Type.....	GR-332	GR-352	GR-372
Size.....	2½"	3½"	4½"
			
	Front of Panel Mounting	Front of Panel Mounting	Front of Panel Mounting
			
	Rear of Panel Mounting	Rear of Panel Mounting	Rear of Panel Mounting

	Scale	Style Number	List Price	Style Number	List Price	Style Number	List Price
Frequency Meter 7-reed	57-63	**202C985A01**	$45.40	**202C986A01**	$46.50	**202C987A01**	$48.70
	47-53	.....	.....	**202C986A02**	46.50	.....	.....
120 volts, 60 hertz①							

① May be operated at 240V. through 68K ohms, ¼ watt resistor.

For rear of panel mounting type, order similar to listed style number, except rear of panel mounting. Weschler will ship a standard listed style at its regular price and will provide a sub item for the bezel at the prices shown and described as:

For Type GR-332
Bezel Style Number – **292B767G04**
List Price — $3.00

For Type GR-352
Bezel Style Number – **292B767G02**
List Price — $3.25

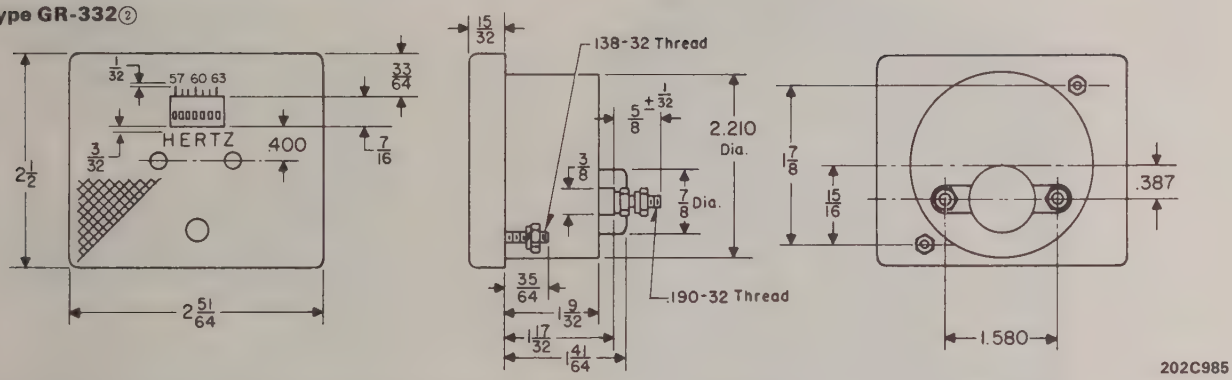
For Type G-372
Bezel Style Number – **292B767G08**
List Price — $3.50

Most instruments available from stock.

Frequency Meters, GR-332, GR-352, GR-372

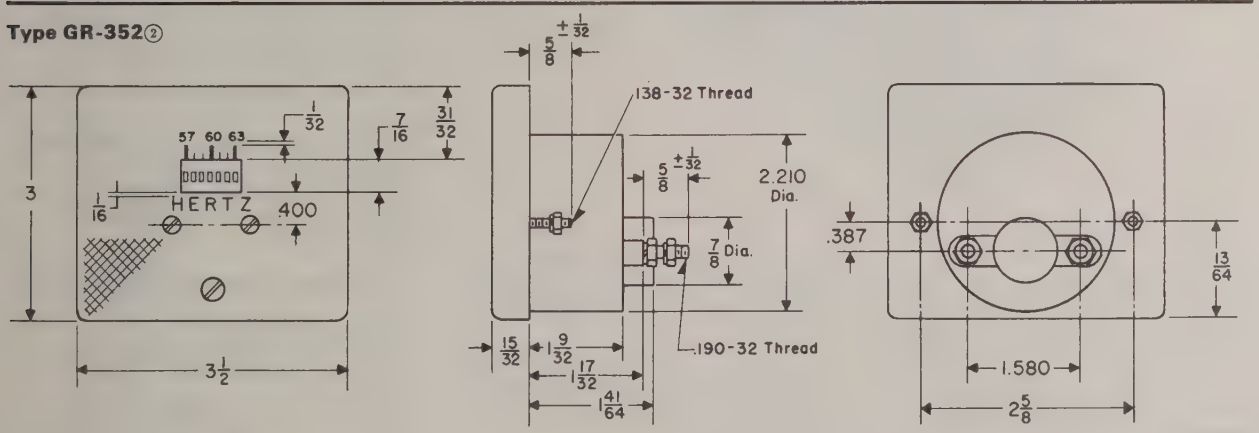
Outline Dimensions And Drilling Plans In Inches

Type GR-332②



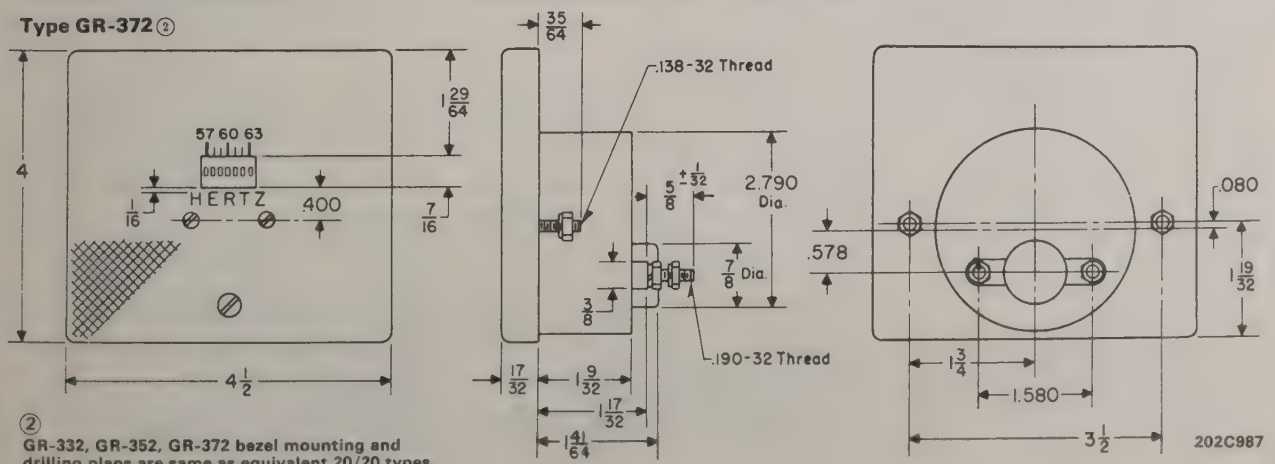
202C985

Type GR-352②



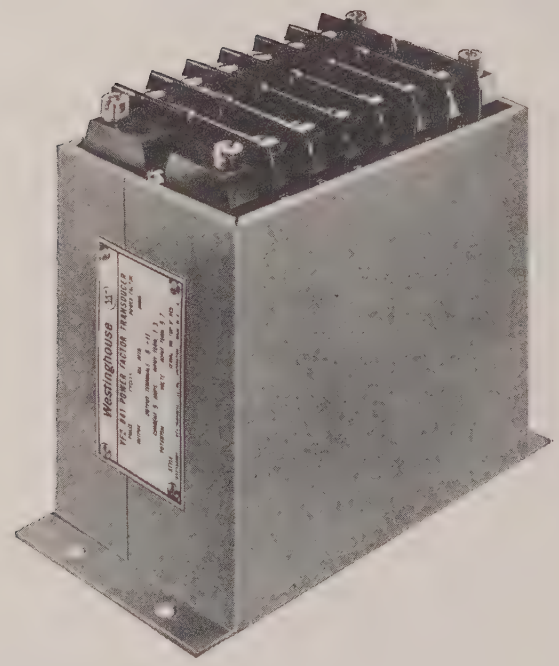
202C986

Type GR-372②



202C987

② GR-332, GR-352, GR-372 bezel mounting and drilling plans are same as equivalent 20/20 types.



Application

Type V-2 transducers convert complex electrical quantities into direct currents which can be measured by conventional indicating instruments. While these devices were designed primarily for combination with Westinghouse panel instruments they can be used with any other manufacturer's instrument. Transducers of this type may be used as inputs to control or data acquisition systems, to computers, to telemeters, or to recorders. Where the output level of the transducer is insufficient it may be combined with an amplifier to get a suitably high signal level. Transducers noted as output non-linear are primarily for use with indicating instruments.

Features

The V-2 transducers are all solid state devices utilizing printed circuit techniques in the basic component assembly. Each has screwdriver adjustments accessible from the top (terminal) side.

A permanent diagram label is attached on one end of the transducer.

All transducers are identical in size, except for a greater width on the single phase var transducer. The base dimensions are such that they can be gang-mounted horizontally or vertically on either a standard rack or on a conventional control panel. The uniform height makes for a neat appearance and ease of wiring group installations. There is no interaction between gang-mounted transducers.

All transducers have unfiltered outputs. Filter modules may be added when minimum output ripple is desired. Filters may be used only with loads of 50,000 ohms or more.

These filter units are made in three types:

1. With 50 ohm load resistor for use with watt and var transducers where a fixed millivolt output is required.

2. With 50 ohm load resistors and potentiometers for use with watt and var transducers where an adjustable (0-50 mv) output voltage is required.

3. With provisions for the external connection of a load resistor to suit the transducer used.

Types Available

Watts

Type VP2-840, Hall Generator
Input: 5 amps, 120 volts, 40, 50, 60 or 400 Hz and 240 volts, 60 Hz.
Output: 50 mv across 50 ohms, linear.
Response Time: Full output within 0.05 sec.
Single Phase, 500 Watts: 1 element.
Three Phase 3 Wire, 1000 Watts: 2 elements.
Three Phase 4 Wire, 1500 Watts: 2½ elements.
Case: 3.0″ x 5.75″.

Vars

Type VV2-840, Hall Generator
Input: 5 amps, 120 volts, 60 or 400 Hz and 240 volts, 60 Hz.
Output: 50 mv across 50 ohms, linear.
Response Time: Full output within 0.05 sec.
3 Phase cross connected, 1 phase internal phase shift.
Single Phase, 500 Vars: 1 element.
3 Phase 3 Wire, 1000 Vars: 2 elements.
3 Phase 4 Wire, 1500 Vars: 2½ elements.
Case: Single phase, 5.5″ x 5.75″, 3 ph 3w and 3 ph 4 wire, 3.0″ x 5.75″.

Frequency

Type VC2-841, Nulling Type
Input: 120 volts with ranges of 59-61, 58-62, 55-65, 50-70, 45-55, 45-65, 390-410, 380-420, 350-450 Hz.
Output: 50 ua per Hz on either side of null, linear. Null at 30% of range up-scale from low frequency end. Null may be at a lower value of the listed range, if so specified when ordered.
Case: 3.0″ x 5.75″.

Power Factor

Type VF2-841, Zero Crossing Switch
Input: 5 amps, 120 volts, 60 Hz, 0.5-1-0.5 power factor.
Output: −0.5-0+.5 ma into 110 ohms, linear with respect to phase angle.
Response Time: Full output within 0.1 sec.
Case: 3.0 x 5.75″.
Not applicable for use with VF2-876 filter unit.

Voltage

Type VE2-841, Bridge Type With RMS Network
Input: 150 volts, 60 or 400 Hz.
Output: 1 ma into 10,000 ohms, linear.
Response Time: Full output within 0.1 sec.
Case: 3.0″ x 5.75″.

Current

Type VI2-841, Bridge Type With RMS Network
Input: 5 amps, 60 or 400 Hz.
Output: 1 ma into 10,000 ohms, linear.
Response Time: Full output within 0.1 sec.
Case: 3.0″ x 5.75″.

Suppressed Zero Voltage

Type VE2-841, Zener Diode With RMS Network
Input: 110-130 volts, 25-1000 Hz.
Output: 500 ua into 280 ohms, non-linear.
Response Time: Full output within 0.1 sec.
Case: 3.0″ x 5.75″.

Speed

Type VR2-841, Pulse Type
Input: Between 0-50 and 0-14,000 pulses/second.
Output: 1 ma into 100 ohms, linear.
Response Time: Full output within 0.1 sec.
Case: 3.0″ x 5.75″.
Requires separate power source of 120 volts, 60 Hz.

Temperature

Type VT2-841, Wheatstone Bridge
Input: Resistance Temperature Detectors (RTD) 10 ohms.
Ranges: 0-100°C. 0-150°C, 0-200°C.
Output: 30 mv into 30 ohms, non-linear.
Case: 3.0″ x 5.75″.
Requires separate power source of 120 volts, 60 Hz.

Filters

Type VF2-876
Output Ripple: ½% of input ripple.
Response Time: Under 200 milliseconds.
Case: 3.0″ x 5.75″.

V-2 Transducers

1% Accuracy Class

Type VP2-840 Watt Transducer

Output 0-50 mV into 50 ohms.

	Description	Nominal Input	Calibrated Watts	Style Number	List Price
	1 ph, (1 element)	5 A, 120 V, 60 Hz	500	**644B137A33**Ⓢ	$125
	1 ph, (1 element)	5 A, 240 V, 60 Hz	1000	691B056A33	139
	1 ph, (1 element)	5 A, 480 V, 60 Hz	2000	691B056A34 Ⓢ	153
	3 ph, 3 w (2 element)	5 A, 120 V, 60 Hz	1000	**644B137A09**Ⓢ	192
	3 ph, 3 w (2 element) ①	5 A, 180 V, 60 Hz	1440	644B137A10	206
62 C	3 ph, 3 w (2 element)	5 A, 240 V, 60 Hz	2000	691B056A09	206
	3 ph, 3 w (2 element)	5 A, 480 V, 60 Hz	4000	691B056A10	220
	3 ph, 4 w (2½ element)	5 A, 120 V, 60 Hz	1500	**644B137A25**Ⓢ	222
	3 ph, 4 w (2½ element)	5 A, 240 V, 60 Hz	3000	691B056A25	225
	1 ph (1 element)	5 A, 120 V, 400 Hz	500	691B057A33	139
	3 ph, 3 w (2 element)	5 A, 120 V, 400 Hz	1000	691B057A09	153
	3 ph, 4 w (2½ element)	5 A, 120 V, 400 Hz	1500	691B057A25	236

① Universal type for reconnectible generators. See supplement to Application Data 43-510.

Type VV2-840 Var Transducer

Output 0-50 mV into 50 ohms. May also be used at ±0-25 mV into 50 ohms at one half calibrated watts listed.

	Description	Nominal Input	Calibrated Vars	Style Number	List Price
	1 ph, (1 element)	5 A, 120 V, 60 Hz	500	714B954A33	$170
	1 ph, (1 element)	5 A, 240 V, 60 Hz	1000	714B954A35	184
63 C	3 ph, 3 w (2 element)	5 A, 120 V, 60 Hz	1000	**714B954A09**Ⓢ	230
	3 ph, 3 w (2 element)	5 A, 240 V, 60 Hz	2000	714B954A11	244
	3 ph, 4 w (2½ element)	5 A, 120 V, 60 Hz	1500	**714B954A25**Ⓢ	260
	3 ph, 4 w (2½ element)	5 A, 240 V, 60 Hz	3000	714B954A27	274
	1 ph, (1 element)	5 A, 120 V, 400 Hz	500	714B954A34	184
	3 ph, 3 w (2 element)	5 A, 120 V, 400 Hz	1000	714B954A10	244
	3 ph, 4 w (2½ element)	5 A, 120 V, 400 Hz	1500	714B954A26	274

Type VC2-841 Frequency Transducer

Input: 120 Volts
Output: ②50 uA/Hz for 50 & 60 Hz Nominal
5 uA/Hz for 400 Hz Nominal

	Range	Output②	Load Resistance	Style Number	List Price
	20- 30 Hz	−150-0-+35 uA	280 ohms	670B907A14	$177
	48- 52 Hz	−60-0-+140 uA	214 ohms	670B907A19	206
	45- 55 Hz	−150-0-+350 uA	280 ohms	670B907A11	177
64 C	45- 65 Hz	−300-0-+700 uA	92 ohms	670B907A17	177
	59- 61 Hz	−30-0-+70 uA	866 ohms	**670B907A15**	233
	58- 62 Hz	−60-0-+140 uA	214 ohms	670B907A16	192
	55- 65 Hz	−150-0-+350 uA	280 ohms	**670B907A09**Ⓢ	163
	50- 70 Hz	−300-0-+700 uA	92 ohms	670B907A10	163
	390-410 Hz	−30-0-+70 uA	866 ohms	670B907A17	252
	380-420 Hz	−60-0-+140 uA	214 ohms	670B907A18	207
	350-450 Hz	−150-0-+350 uA	280 ohms	670B907A13	177

② Output may be 0 at lower value of frequency on special order. Add **$12.00.**

Ⓢ Denotes item available from stock.

Type VF2-841 Power Factor Transducer

Input: 5 Amp, 120 Volt, 60 Hertz
Output: −.5 −0 +.5 mA Into 110 Ohms, Linear With Respect To Phase Angle

65 C

Description		Style Number	List Price
1 ph	50-100-50%	**671B998A25**	$177
3 ph, 3 w	50-100-50%	**671B998A27**Ⓢ	163
3 ph, 4 w	(120/208 volt) 50-100-50%	671B998A29	177

For 240 volts, **add $10.00.**

Type VE2-841 Voltage Transducer (Approx. rms)

Input: 150 Volt
Output: 1 mA Into 10,000 Ohms, Linear

66 C

Description	Style Number	List Price
60 Hz	**606B229A09**Ⓢ	$78
400 Hz	606B229A10	94

Type V12-841 Current Transducer (Approx. rms)

Input: 5 Amp
Output: 1 mA Into 10,000 Ohms, Linear

67 C

Description	Style Number	List Price
60 Hz	**606B230A09**Ⓢ	$78
400 Hz	606B230A10	94

Type VE2-841 Suppressed Zero Voltage Transducer

Input: 120 Volt Nominal, Accuracy 0.3% of Nominal
Output: 500 uA Into 280 Ohms, Non-Linear

68 C

Range		Style Number	List Price
110-130 volts	25-1000 Hz	**671B321A21**	$117
110-130 volts	dc	671B321A22	130

Type VR2-841 Speed (Pulse) Transducer

Input: dc Pulse .5 to 20 Volts, ac Wave 1 to 40 Volts
Output: 1 mA Into 100 Ohms, Linear

69 C

Range	Style Number	List Price
0-50 to 0-14,000 pulses per second	.....	$192

Type VT2-841 Temperature Transducer

Input: Resistance Temperature Detector (RTD) 10 Ohms. (RTD Not Included)
Output: 30 mV Into 30 Ohms, Non-Linear
Power Supply: 120 Volt, 60 Hertz

70 C

Range	Style Number	List Price
0-100°C	**691B694A09**	$192
0-150°C	**691B694A10**Ⓢ	192
0-200°C	**691B694A11**Ⓢ	192

Type VW2-841 Motor Load Indicator Transducer

Input: 5 Amp, 120/240/480 Volts
Output: 1 mA Into 200 Ohms

71 C

Range	Style Number	List Price
0-150% load	715B260A09	$101

Type VF2-876 Filter Unit

For use with transducers, where required.

72 C

Style Number	Input Resistance	Output	List Price
715B261A09Ⓢ	Open③	Non-adjustable	$ 74
715B261A10	50 Ohms ±½%	Non-adjustable	82
715B261A11	50 Ohms ±½%	Adjustable	104

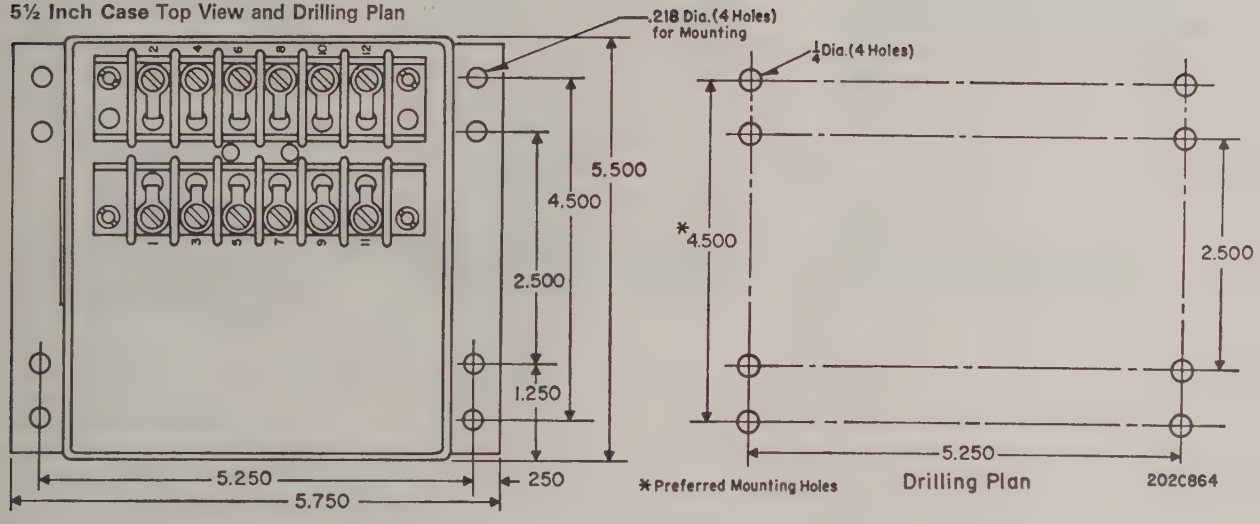
③ Connect external resistor of required ohmic value across terminals 5 and 7.
Ⓢ Denotes item available from stock.

V-2 Transducers

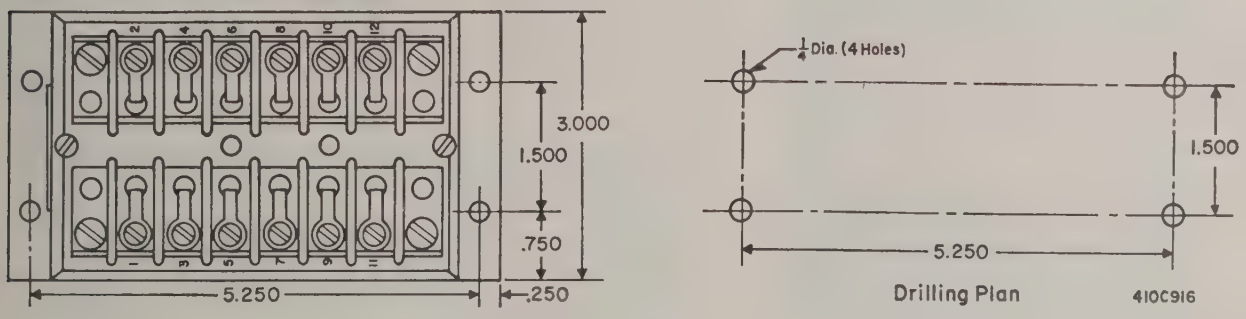
1% Accuracy Class

Outline Dimensions (In Inches)

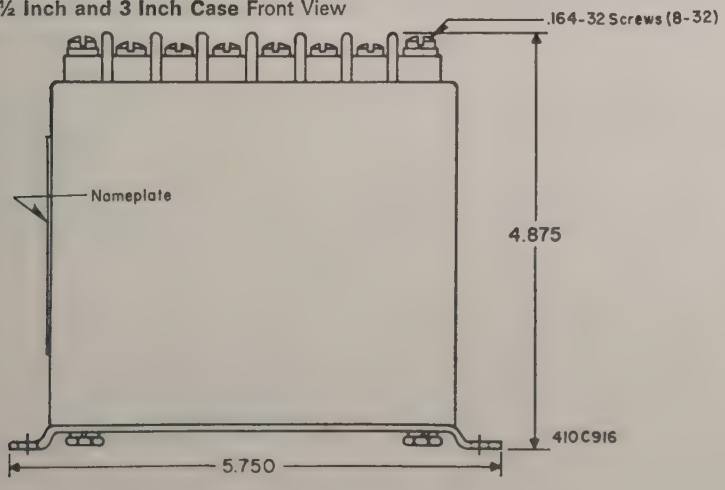
5½ Inch Case Top View and Drilling Plan



3 Inch Case Top View and Drilling Plan



5½ Inch and 3 Inch Case Front View



Further Information

Prices, Ordering Information:
Transducers and Filter Unit – Sections 62-72

Application Data: AD 43-860

Instructions:
Watt Transducer – IL 43-840.3
Power Factor Transducer – IL 43-841.5
Frequency Transducer – IL 43-841.3
Var Transducer – IL 43-840.4
Voltage RMS, Current RMS Expanded Voltage Transducer – IL 43-841.1
Temperature Transducer – IL 43-841.6
Speed (Pulse) Transducer – IL 43-841.7
Filters – IL 43-876.1

Modification and Calibration: IL 43-800.3

Application Data

Table F-Ac Panel Instruments

Approximate Loss (Volt-Amperes) at 60 Hz

Full Scale Rating	20/20	Conventional
5-8 mA	1 vA max.	1 vA max.
10-800 mA	1 vA max.	1 vA max.
1-3 A	1 vA max.	1 vA max.
5 A	1 vA max.	1 vA max.
8 A	1 vA max	1 vA max
10 A	1 vA max.	1 vA max.
15 A	1 vA max	1 vA max
20 A	1 vA max	1 vA max.
30 A	2 vA max	2 vA max.
50 A	2 vA max	2 vA max.
1.5 V (moving iron)	3 vA max.	3 vA max.
2 V (moving iron)	3 vA max	3 vA max.
3 V (moving iron)	3 vA max	3 vA max.
5 V (moving iron)	3 vA max	3 vA max.
8 V (moving iron)	3 vA max	3 vA max.
10 V (moving iron)	3 vA max.	3 vA max.
15 V (moving iron)	3 vA max	3 vA max.
20 V (moving iron)	3 vA max	3 vA max.
30 V (moving iron)	3 vA max	3 vA max.
50 V (moving iron)	3 vA max.	3 vA max.
80 V (moving iron)	3 vA max	3 vA max.
100 V (moving iron)	3 vA max	3 vA max.
150 V (moving iron)	3 vA max.	3 vA max.
200 V (moving iron)	3 vA max.	3 vA max.
300 V (moving iron)	3 vA max.	3 vA max.
500 V (moving iron)	3 vA max.	3 vA max.
600 V (moving iron)	3 vA max.	3 vA max.
750 V (moving iron)	3 vA max.	3 vA max.
800 V (moving iron)	3 vA max	3 vA max.

Table H— Transducer-Type Panel Instruments

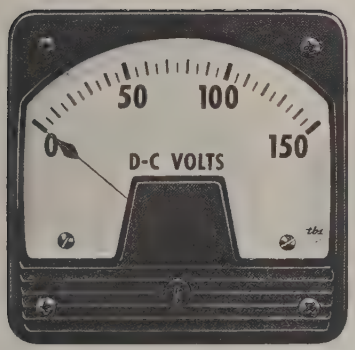
Approximate Loss (Volt-Amperes)

Type	Voltage Circuit	Current Circuit
Resistance Thermometer	.....	.....
Zener Suppressed Voltmeter	.....	.....
Frequency Meter	2.8 vA @ 120 V 1.00 pf	.....
Varmeter	1.0 vA	2.0 vA
Wattmeter	1.0 vA	2.0 vA @ 20% pf

Table I— Elapsed Time Meters

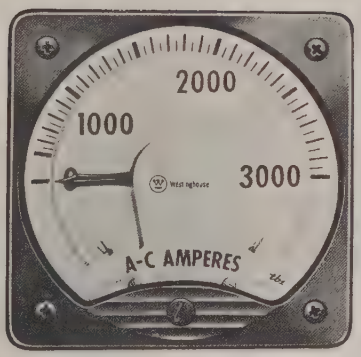
Approximate Loss (Watts)

Rating	Type GH		Type BH
	332	352	351
120 v, 50 Hz	2 watts	2 watts	2 watts
120 v, 60 Hz	2 watts	2 watts	2 watts
240 v, 60 Hz	2 watts	2 watts	2 watts
480 v, 60 Hz	2 watts	2 watts	2 watts



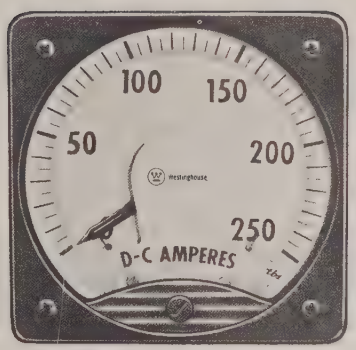
K-221 Line (DB 43-220)

Type K-221 instruments are the lowest priced of the Westinghouse switchboard instruments, yet they meet the same rigid performance specifications as the more expensive types. These instruments are recommended for use where they can be read from a distance of less than twelve feet. The Type K-221 is used most effectively on industrial apparatus such as mill drives, generator sets, power rectifiers and converters. It is most practical for electric utility uses such as in substations where readings are taken only occasionally, but where the ultimate in reliability is required.



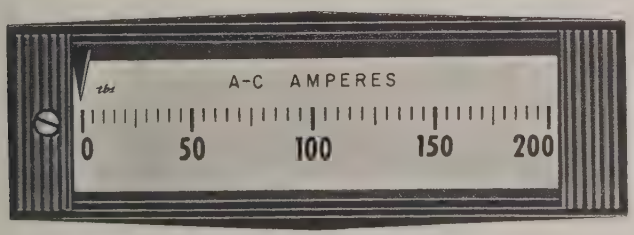
K-231 Line (DB 43-230)

The 180° scale type K-231 instrument is a variant of the 250° scale type K-241 design. By restricting the pointer travel to 180° it is possible to achieve certain economies in manufacture without affecting the reliability of the instruments. These economies are reflected in a lower price. Type K-231 instruments are used where some readability may be sacrificed but where circuits associated with the instruments are critical in nature. This is usually the case where current and potential transformers or transducers are shared with devices having protective or control functions.



K-241 Line (DB 43-240)

The Type K-241 instruments have been designed to achieve the ultimate in reliability and performance. They are relatively expensive, reflecting the cost of that achievement. Instruments of this class are recommended for use on electric utility switchboards and control panels for similar industrial service.

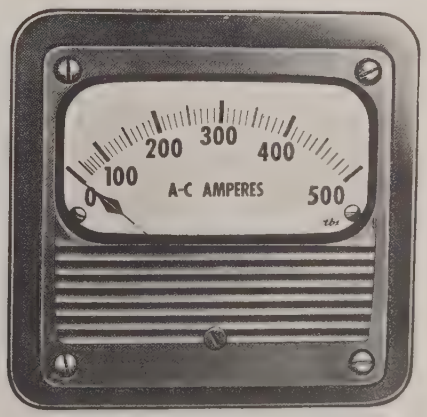


252 Line (DB 43-252)

Type 252 instruments incorporate into edgewise instruments the same taut-band suspension system which is used in the highest quality Westinghouse portable and switchboard instruments.

They are available in types for direct measurement of standard electrical quantities, or in combination with transducers for measuring any other electrical or mechanical quantity capable of being converted into a proportional electrical quantity.

Edgewise instruments are particularly suited to electric utility or industrial processes.



K-251 Line (DB 43-250)

Type K-251 instruments are an updated version of the conventional 100 degree switchboard instruments which have set the standards of performance. They have capabilities in performance, sensitivity and flexibility which cannot be met by the newer circular scale types. The K-251 type is used in two principal areas of application: The first in conventional switchboard applications where the user has a preference for reading in a limited arc; the second where there is need for sensitivity, frequency, accuracy or resolution higher than that available on 250° mechanisms.

Type 251 instruments have been designed for the maximum reliability to assure the security of any control or protective circuits into which they may be introduced.

73 D

	Circular Scale			100° Scale		Edgewise
	4½" 180°	4½" 250°	8¾" 250°	4½"	5¾" Projection-U 6½" Flush-K 7" Round Detachable-E	6" x 1¾"
Dc Microammeter, 1%						
	KX-231	KX-241	KX-261	KX-221	KX-251 UX-251	VX-252 HX-252
20μA	..	..	..	$322.00	$349.00	$155.00
30μA	..	..	..	311.00	337.00	
50μA	$305.00	$320.00	$411.00	305.00	332.00	138.00
100μA	222.00	237.00①	328.00	222.00	249.00	129.00
200μA	184.00	199.00①	290.00	184.00	211.00	119.00
300μA	184.00	199.00①	290.00	184.00	211.00	..
400μA	184.00	199.00①	290.00	..	..	..
500μA	182.00	197.00①	288.00	182.00	209.00	109.00
750μA	182.00	197.00①	288.00	..	..	..
800μA	..		..	182.00	209.00	109.00
Dc Milliammeter, 1%						
	KX-231	KX-241	KX-261	KX-221	KX-251 EX-251 UX-251	VX-252 HX-252
1, 2, 5, 10, 20, 30, 50, 100, 200, 300, 350	160.00	175.00①	266.00	160.00 160.00 160.00	187.00 187.00 187.00	109.00 109.00 ..
3, 8, 15, 80, 400, 800						
600600						
Dc Ammeter, 1%						
	KX-231	KX-241	KX-261	KX-221	KX-251 UX-251	VX-252 HX-252
1, 2, 5, 10, 20, 30, 40, 50	176.00	191.00①	282.00	176.00	203.00	109.00
1.5, 3, 8, 15	176.00	191.00①	282.00	176.00	203.00	..
2.5, 25	..	..	..	176.00	203.00	..
Dc Ammeter						
					KX-251 UX-251	VX-252
Used with external 50 mV shunt	KX-231	KX-241	KX-261	KX-221	EX-251	HX-252
5, 10, 15, 25, 50, 75, 100, 150, 200, 250, 300, 400, 500, 600, 800	155.00	170.00①	260.00	155.00	181.00	109.00
1K, 1.5K, 2K, 2.5K, 3K, 4K, 5K, 6K, 8K, 10K	155.00	170.00①	260.00	155.00	181.00	109.00
Dc Millivoltmeter, 1%						
					UX-251 KX-251	HX-252
	KX-231	KX-241	KX-261	KX-221	EX-251	VX-252
50, 100, 200, 500	173.00	188.00	279.00	173.00	199.00	118.00
Dc Voltmeter						
					UX-251 KX-251	HX-252
	KX-231	KX-241	KX-261	KX-221	EX-251	VX-252
1	..	..	..	..	..	109.00
2, 5, 8, 15, 30, 80, 150	164.00	179.00①	270.00	164.00	190.00	109.00
10, 50, 100	..	..	..	164.00	190.00	109.00
300	174.00	189.00①	280.00	174.00	201.00	129.00
600	203.00	218.00①②	309.00	203.00	229.00	129.00
800	214.00	229.00①	320.00	214.00	241.00	140.00

① KX-241 is also available in Navy HI-Shock, 1½% accuracy. Add $23.00 to List Price.
② Navy HI-Shock for 400 volt rating priced at $241.00 list.

Switchboard Instruments

For a full listing of ratings and prices, ask for Westinghouse descriptive bulletins and price lists.

73 D continued

	Circular Scale			100° Scale		Edgewise
	4½" 180°	4½" 250°	8¾" 250°	4½"	5½" Projection-U 6½" Flush-K 7" Round Detachable-E	6" x 1¾"
Ac Milliammeter						
25-200 Hz on circular scale					UA-251	
15-500 Hz on 100° scale	KA-231	KA-241	KA-261	KA-221	KA-251	
10, 20, 50, 100, 200, 500	$134.00	$157.00 ①	$248.00	$134.00	$168.00	..
Ac Ammeter						
25-200 Hz on circular scale					KA-251	
15-500 Hz on 100° scale					UA-251	
1, 1.5, 2, 3, 5, 8, 10, 15, 20	KA-231	KA-241	KA-261	KA-221	EA-251	
25	134.00	157.00 ①	248.00	134.00	168.00②	..
30, 40, 50	..	..	..	134.00	168.00②	..
	..	..	..	143.00	178.00②	..
Ac Ammeter for use with current transformer						
5 amp full scale					KA-251	
25-200 Hz on circular scale					UA-251	
15-500 Hz on 100° scale	KA-231	KA-241	KA-261	KA-221	EA-251	
Scaled to match current transformer	134.00	157.00 ①	248.00	134.00	168.00	..
Ac Voltmeter						
25-100 Hz on circular scale					KA-251	
25-150 Hz on 100° scale					EA-251	
15-150 Hz on E type	KA-231	KA-241	KA-261	KA-221	UA-251	
15, 30, 80		..	..	147.00	181.00	..
150	147.00	170.00①	260.00	147.00	181.00	..
300	160.00	298.00①	274.00	160.00	195.00	..
600	186.00	209.00①	299.00	186.00	220.00	..
800		..	..	197.00	232.00	..
Ac Voltmeter for use with potential transformer						
25-100 Hz on circular scale					KA-251	
15-150 Hz on 100° scale					UA-251	
Scaled to match potential transformer	KA-231	KA-241	KA-261	KA-221	EA-251	
	147.00	170.00 ①	260.00	147.00	181.00	..
Ac Voltmeter, suppressed zero						
Accuracy 0.3% of mid-scale value					KC-251	
25-1000 Hz					UC-251	VC-252
90-130, 100-140, 105-135, 110-130, 115-125	KC-231	KC-241	KC-261	KC-221	EC-251	HC-252
105-125	316.00	339.00	429.00	316.00	350.00③	$271.00
	316.00	339.00	429.00	..	..	..
Ac Voltmeter, expanded scale						
Accuracy 0.3% of mid-scale value		KC-241	KC-261			
0-90-130, 0-110-130	..	357.00	448.00	..	..	..
Ac Rectifier Voltmeter						
20-10,000 Hz on circular scale					KC-251	VC-252
25-10,000 Hz on 100° scale					UC-251	HC-252
60 Hz edgewise	KC-231	KC-241	KC-261	KC-221		
5, 10, 15, 20, 30, 50, 100, 150	205.00	220.00 ①	311.00	205.00	232.00	127.00
8, 25, 80	..	..	..	205.00	232.00	..
200, 250	..	..	..	213.00	240.00	..
300	213.00	228.00	319.00	213.00	240.00	129.00
600	241.00	256.00	347.00	241.00	267.00	159.00
800	..	..	..	252.00	279.00	

① KX-241 is also available in Navy HI-Shock. 1½% accuracy. Add $23.00 to List Price.
② EA-251 available only for 5, 10, 15, 25 A and 30 A priced at $168.00; 50 A priced at $178.00.
③ EC-251 available in 110-130 v ac or dc only.

Switchboard Instruments

For a full listing of ratings and prices, ask for Westinghouse descriptive bulletins and price lists.

73 D continued

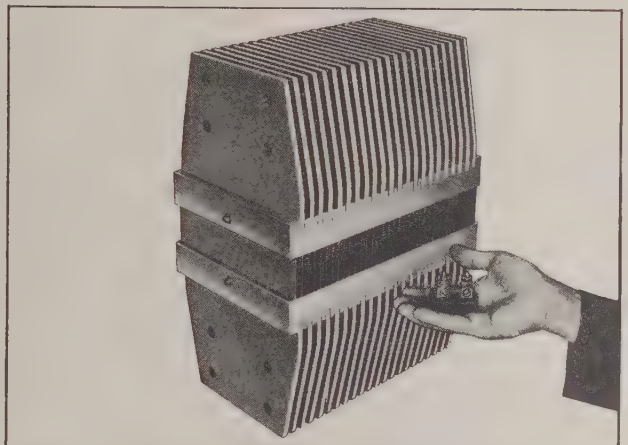
	Circular Scale			100° Scale		Edgewise
	4½" 180°	4½" 250°	8¾" 250°	4½"	5½" Projection-U 6½" Flush-K 7" Round Detachable-E	6" x 1¾"
Resistance Thermometer 120 volt, 60 Hz 0-100°C, 0-150°C, 0-200°C, 0-200°F	KX-231 $501.00	KX-241 $535.00	KX-261 $626.00	KX-221 $501.00	KX-251 UX-251 $547.00	VX-252 HX-252 $345.00
Frequency Meter, Self-Contained 120 volt, accuracy 2% of span	KR3-231	KR3-241	KR3-261	KR3-221	KR3-251 UR3-251	VR3-252 HR3-252
45-55, 45-65, 50-70, 55-65	451.00	486.00②	577.00	451.00	497.00	328.00
350-450	471.00	505.00③	596.00	471.00	517.00	328.00
59-61	586.00	620.00	711.00	586.00	608.00	393.00
390-410	643.00	678.00	769.00	643.00	689.00	414.00
48-52	562.00	596.00	687.00	562.00	608.00	362.00
380-420	608.00	642.00	733.00	608.00	654.00	363.00
58-62	562.00	596.00	687.00	562.00	608.00	345.00
Power Factor Meter 5A, 120V, 60 Hz Pivot and jewel	KI-231	KI-241	KI-261	KY-221	KY-25 UY-25	VX-252⑤ HX-252⑤
1 ph, 2 quad. 0-1-0 on 180° scale, 50-100-50 on 100° scale	458.00	493.00①	584.00	458.00	504.00	..
3 ph, 3w, 2 quad. 0-1-0 on 180° scale, 50-100-50 on 100° scale or 10-100-80 on 100° scale	359.00	394.00①	485.00	359.00	405.00	312.00
3 ph, 3w, 4 quad. 0-1-0 on circular scale, 0-100-0 on 100° scale	388.00	423.00	513.00	..	.....	..
Synchroscope, 120 volt Pivot and jewel	KI-231	KI-241	KI-261		KI-25 UI-25	
60 Hz	328.00	478.00	569.00	Use	489.00	..
50 Hz	328.00	478.00	569.00	Type	..	..
400 Hz	458.00	493.00①	584.00	KI-241	..	..
Ac Wattmeter 5A, 120V, 60 Hz 15-500 Hz on 100° scale (E type uses external transducer)	KP-231	KP-241	KP-261	KY-221	EX-251 KY-25④ UY-25④	VX-252 HX-252
1 element, 1 ph	294.00	328.00①	419.00	294.00	340.00	268.00
2 element, 1 ph, 3w and 2 element 3 ph, 3w	404.00	439.00①	529.00	404.00	450.00	345.00
2½ element, 3 ph, 4w	431.00	465.00①	556.00	431.00	472.00	380.00
Ac Varmeter (Self-Contained) 5A, 120V, 60 Hz	KP-231	KP-241	KP-261	KY-221	KY-25④ UY-25④	VX-252 HX-252
2 element, 3 ph 3w	482.00	517.00①	608.00	482.00	528.00	389.00
2½ element, 3 ph 4w	509.00	543.00①	634.00	509.00	555.00	424.00

① KX-241 is also available in Navy HI-Shock. 1½% accuracy. Add $23.00 to List Price.
② Navy HI-Shock KX-241 with external transducer (55-65 Hz only) is available at $509.00.
③ Navy Hi-Shock KX-241 with external transducer is available at $528.00.
④ Pivot and jewel suspension.
⑤ Taut-Band suspension.

Empro SHUNTS ®

ACCURACY - 1/4%

EMPRO MANUFACTURING CO., INC.
World's Largest Shunt Manufacturer



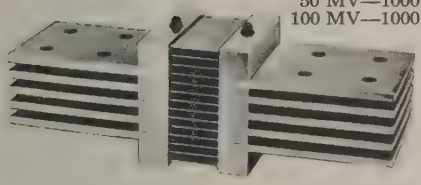
Largest (F) and smallest (Lightweight) models. The Type F style shown here has rated capacities over 10,000 amps.

TYPE A

50 MV—15 through 600 amperes
100 MV—50 through 600 amperes

TYPE C

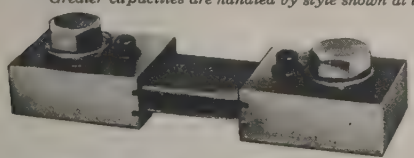
50 MV—1000 through 2000 amperes
100 MV—1000 through 2000 amperes



TYPE F

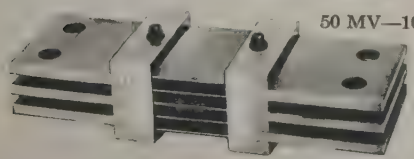
50 MV—2500 through 30000 amperes
100 MV—2500 through 10000 amperes

Note: Style shown here has rated capacities of 10,000 amps and under. Greater capacities are handled by style shown at top right.



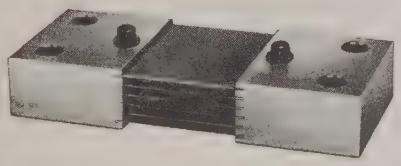
TYPE TRW-50

50 MV—100 through 600 amperes



TYPE WT

50 MV—1000 through 10000 amperes
100 MV— 600 through 6000 amperes

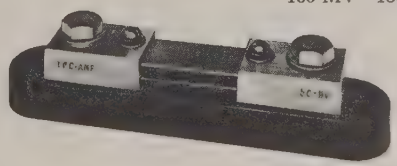


TYPE B

50 MV—300 through 1200 amperes
100 MV—300 through 1200 amperes

TYPE E

50 MV—1500 through 2000 amperes
100 MV—1500 through 2000 amperes

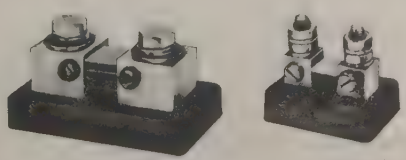


TYPE HA

50 MV—1 through 500 amperes
100 MV—1 through 500 amperes

TYPE W

50 MV—300 through 1000 amperes
100 MV—120 through 500 amperes



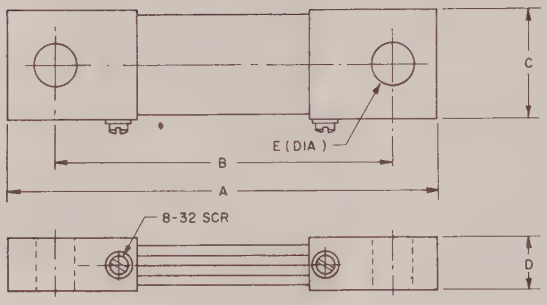
LIGHTWEIGHT

50 MV—5 through 1200 amperes

ALL TYPES ALSO AVAILABLE IN 25 MV

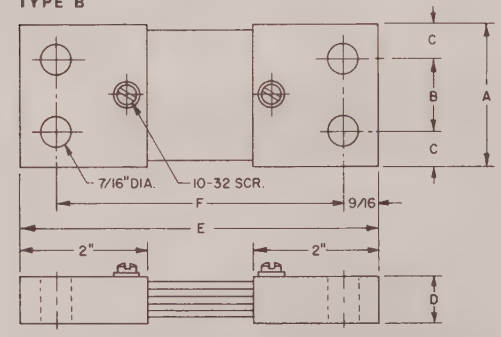
74 D

TYPE A

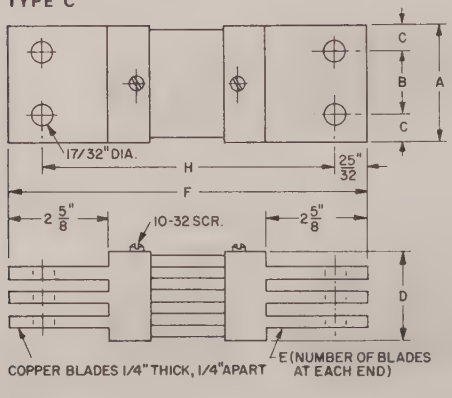


- All dimensions in this catalog are in inches.
- Shunt prices do not include leads.
  5-ft. leads, #18 twisted wires . . . $2.40 per pair net.
  Resistance 0.064 ohms
  6-ft. leads, #18 twisted wires . . . $2.60 per pair net
  Resistance 0.078 ohms
  Write for prices of other lengths.

TYPE B



TYPE C



TYPE A • 50 MV

CATALOG NUMBER	AMP	A	B	C	D	E	LIST PRICE
A-15-50	15	4⅛	3 5/16	⅜	⅜	11/32	$11.24
A-20-50	20	4⅛	3 5/16	⅜	⅜	11/32	11.24
A-50-50	50	4⅛	3 5/16	⅜	⅜	11/32	11.24
A-75-50	75	4⅛	3 5/16	⅜	⅜	11/32	11.24
A-100-50	100	4⅛	3 5/16	⅜	⅜	11/32	11.24
A-125-50	125	4⅛	3 5/16	13/16	⅜	11/32	11.24
A-150-50	150	4⅛	3 5/16	15/16	⅜	11/32	11.24
A-175-50	175	4⅛	3 5/16	¾	½	11/32	11.24
A-200-50	200	4⅛	3 5/16	13/16	½	11/32	11.24
A-250-50	250	4⅛	3 5/16	1 1/16	½	11/32	12.96
A-300-50	300	4⅛	3 5/16	1¼	½	11/32	12.96
A-375-50	375	4⅝	3⅜	15/16	¾	13/32	16.23
A-400-50	400	4⅝	3⅜	1	¾	13/32	16.23
A-500-50	500	4⅝	3⅜	1¼	¾	13/32	19.35
A-600-50	600	4⅝	3⅜	1½	¾	13/32	24.20

TYPE A • 100 MV

A-50-100	50	5¾	4 15/16	⅜	⅜	11/32	$12.96
A-75-100	75	5¾	4 15/16	⅜	⅜	11/32	12.96
A-100-100	100	5¾	4 15/16	⅜	⅜	11/32	12.96
A-150-100	150	5¾	4 15/16	15/16	⅜	11/32	12.96
A-200-100	200	5¾	4 15/16	13/16	½	11/32	12.96
A-250-100	250	5¾	4 15/16	1 1/16	½	11/32	15.80
A-300-100	300	5¾	4 15/16	1¼	½	11/32	15.80
A-375-100	375	6¼	5 5/16	15/16	¾	13/32	19.07
A-400-100	400	6¼	5 5/16	1	¾	13/32	19.07
A-500-100	500	6¼	5 5/16	1¼	¾	13/32	22.20
A-600-100	600	6¼	5 5/16	1½	¾	13/32	27.04

TYPE B • 50 MV

CATALOG NUMBER	AMP	A	B	C	D	E	F	LIST PRICE
B-300 50	300	1¾	1	⅜	½	5⅞	4¼	$14 93
B-400-50	400	2	1¼	⅜	¾	5⅞	4¼	18.94
B-500-50	500	2	1¼	⅜	¾	5⅞	4¼	22.06
B-600-50	600	2	1¼	⅜	¾	5⅞	4¼	26.04
B-750-50	750	2¼	1½	⅜	¾	5⅞	4¼	28.70
B-800-50	800	2⅜	1½	7/16	¾	5⅞	4¼	31.46
B-1000-50	1000	2½	1½	½	1	5⅞	4¼	40.42
B-1200-50	1200	2⅜	1½	11/16	1	5⅞	4¼	48.81

TYPE B • 100 MV

B-300-100	300	1¾	1	⅜	½	7¼	6⅝	$17.80
B-400-100	400	2	1¼	⅜	¾	7¼	6⅝	21.79
B-500-100	500	2	1¼	⅜	¾	7¼	6⅝	24.90
B-600-100	600	2	1¼	⅜	¾	7¼	6⅝	28.89
B-750-100	750	2¼	1½	⅜	¾	7¼	6⅝	31.87
B-800-100	800	2⅜	1½	7/16	¾	7¼	6⅝	34.31
B-1000-100	1000	2½	1½	½	1	7¼	6⅝	43.83
B-1200-100	1200	2⅜	1½	11/16	1	7¼	6⅝	52.23

TYPE C • 50 MV

CATALOG NUMBER	AMP	A	B	C	D	E	F	H	LIST PRICE
C-1000-50	1000	2⅜	1½	9/16	1½	2	9 1/16	7½	59.50
C-1200-50	1200	3	1½	¾	1½	2	9 1/16	7½	62.47
C-1500-50	1500	3	1½	¾	1½	2	9 1/16	7½	70.88
C-2000-50	2000	3¼	2	⅝	2	3	9 1/16	7½	84.54

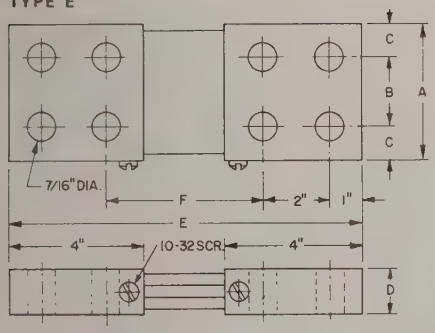
TYPE C • 100 MV

C-1000-100	1000	2⅜	1½	9/16	1½	2	10⅜	9 1/16	$62.91
C-1200-100	1200	3	1½	¾	1½	2	10⅜	9 1/16	65.89
C-1500-100	1500	3	1½	¾	1½	2	10⅜	9 1/16	75.44
C-2000-100	2000	3¼	2	⅝	2	3	10⅜	9 1/16	91.37

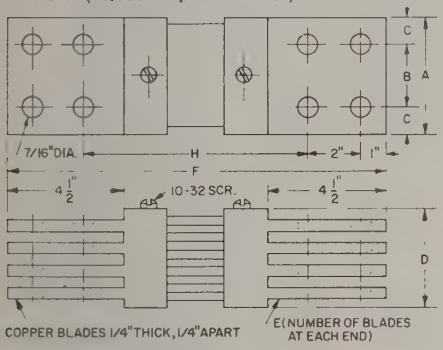
Dc Ammeter Shunts

74 D continued

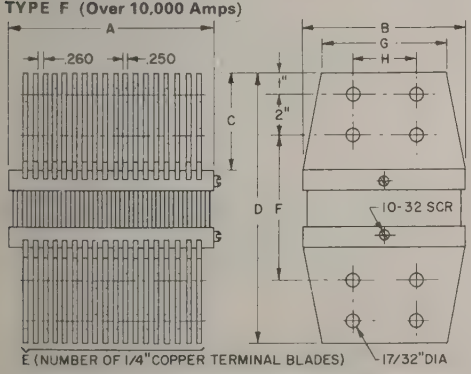
TYPE E



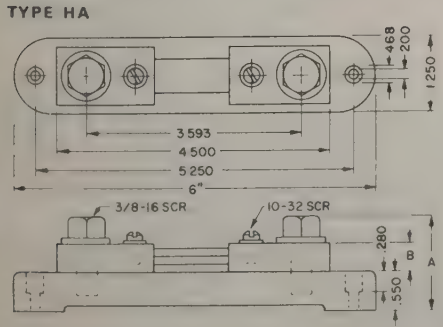
TYPE F (10,000 Amps and Under)



TYPE F (Over 10,000 Amps)



TYPE HA



TYPE E • 50 MV

CATALOG NUMBER	AMP	A	B	C	D	E	F	LIST PRICE
E-1500-50	1500	3	2	½	1	9⅜	3⅜	$57.92
E-2000-50	2000	4	2	1	1	9⅜	3⅜	68.60

TYPE E • 100 MV

E-1500-100	1500	3	2	½	1	11¼	5¼	$62.46
E-2000-100	2000	4	2	1	1	11¼	5¼	75.44

TYPE F (10,000 Amps and Under) 50 MV

CATALOG NUMBER	AMP	A	B	C	D	E	F	H	LIST PRICE
F-2500-50	2500	4	2	1	1½	2	12⅝	6⅛	$104.46
F-3000-50	3000	4	2	1	2	3	12⅝	6⅛	130.92
F-4000-50	4000	4	2	1	3	4	12⅝	6⅛	167.52
F-4500-50	4500	4	2	1	3	4	12⅝	6⅛	189.29
F-5000-50	5000	4	2	1	3	4	12⅝	6⅛	194.98
F-6000-50	6000	4	2	1	4	5	12⅝	6⅛	229.99
F-7000-50	7000	5	2½	1¼	4	5	12⅝	6⅛	272.67
F-7500-50	7500	5	2½	1¼	4	6	12⅝	6⅛	301-13
F-8000-50	8000	5	2½	1¼	4	6	12⅝	6⅛	335.01
F-9000-50	9000	5	2½	1¼	4	6	12⅝	6⅛	381.57
F-10000-50	10000	5	2½	1¼	5	7	12⅝	6⅛	420.26

TYPE F (10,000 Amps and Under) 100 MV

F-2500-100	2500	4	2	1	1½	2	14¼	8¼	$115.85
F-3000-100	3000	4	2	1	2	3	14¼	8¼	145.16
F-4000-100	4000	4	2	1	3	4	14¼	8¼	184.59
F-4500-100	4500	4	2	1	3	4	14¼	8¼	207.50
F-5000-100	5000	4	2	1	3	4	14¼	8¼	214.33
F-6000-100	6000	4	2	1	4	5	14¼	8¼	249.90
F-7000-100	7000	5	2½	1¼	4	5/	14¼	8¼	295.44
F-7500-100	7500	5	2½	1¼	4	6	14¼	8¼	329.60
F-8000-100	8000	5	2½	1¼	4	6	14¼	8¼	369.17
F-9000-100	9000	5	2½	1¼	4	6	14¼	8¼	420.31
F-10000-100	10000	5	2½	1¼	5	7	14¼	8¼	460.11

TYPE F (Over 10,000 Amps) 50 MV

CATALOG NUMBER	AMP	A	B*	C	D	E†	F	G	H	LIST PRICE
F-12000-50	12,000	6	5¼	4½	12⅝	9	6⅝	4	2	$513.31
F-15000-50	15,000	6	8	4½	13	9	7	6	4	615.22
F-18000-50	18,000	6	8	4½	13	10	7	6	4	790.55
F-20000-50	20,000	7	8	4⅝	13 1/16	10	7	6	4	939.20
F-25000-50	25,000	10	8	4⅝	13 1/16	18	7	6	4	1,063.93
F-30000-50	30,000	12	8	5 13/32	15⅝	22	9 11/16	6	4	1,512.64

*(B) + or − .250

†(E) ⅜" or ½" terminal blades available

NOTE: Type F 100 MV drop models are also available.

TYPE HA

50 MV

CATALOG NUMBER	AMP	A	B	LIST PRICE
HA- 1-50*	1	1.38	.500	$13.96
HA- 2-50*	2	1.38	.500	13.96
HA- 5-50*	5	1.38	.500	13.96
HA- 10-50*	10	1.38	.500	13.96
HA- 20-50	20	1.38	.500	13.96
HA- 50-50	50	1.38	.500	13.96
HA-100-50	100	1.38	.500	13.96
HA-150-50	150	1.38	.500	13.96
HA-200-50	200	1.38	.500	13.96
HA-250-50	250	1.63	.750	15.66
HA-300-50	300	1.63	.750	15.66
HA-400-50	400	1.63	.750	17.21
HA-500-50	500	1.63	.750	17.21

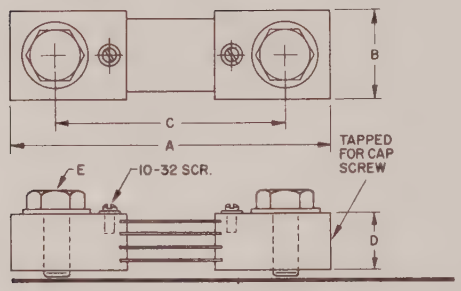
100 MV

CATALOG NUMBER	AMP	A	B	LIST PRICE
HA- 1-100*	1	1.38	.500	$15.85
HA- 2-100*	2	1.38	.500	15.85
HA- 5-100*	5	1.38	.500	15.85
HA- 10-100*	10	1.38	.500	15.85
HA- 15-100*	15	1.38	.500	15.85
HA- 20-100*	20	1.38	.500	15.85
HA- 25-100	25	1.38	.500	15.85
HA- 50-100	50	1.38	.500	15.85
HA- 75-100	75	1.38	.500	15.85
HA-100-100	100	1.38	.500	15.85
HA-200-100	200	1.38	.500	15.85
HA-300-100	300	1.63	.750	17.27
HA-500-100	500	1.63	750	17.27

*Low amperage models are furnished with protective covers.

74 D continued

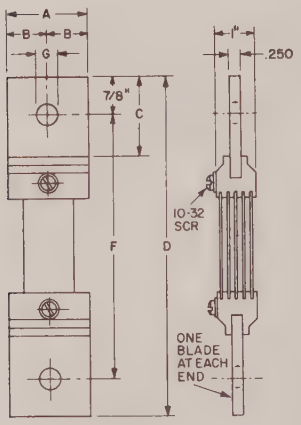
TYPE TRW



TYPE TRW • 50 MV

CATALOG NUMBER	AMP	MV	A	B	C	D	E	LIST PRICE
TRW-100-50	100	50	4½	1	3½	½	⅜-16 x ¾	$13.07
TRW-150-50	150	50	4½	1	3½	½	⅜-16 x ¾	13.96
TRW-200-50	200	50	4½	1	3½	½	⅜-16 x ¾	13.96
TRW-250-50	250	50	5⅜	1⅜	4	⅝	½-13 x 1	14.80
TRW-300-50	300	50	5⅜	1⅜	4	⅝	½-13 x 1	16.23
TRW-400-50	400	50	5⅜	1⅜	4	⅝	½-13 x 1	20.21
TRW-500-50	500	50	5½	1½	4	1	½-13 x 1¼	24.20
TRW-600-50	600	50	5½	1½	4	1	½-13 x 1¼	29.03

TYPE W



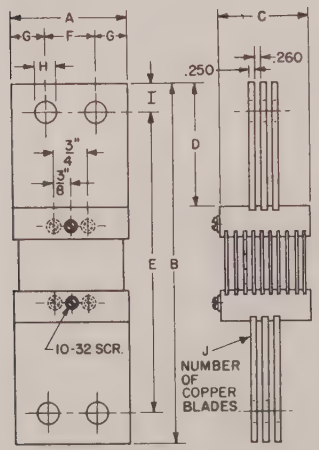
TYPE W • 50 MV

CATALOG NUMBER	AMP	MV	A	B	C	D	F	G	LIST PRICE
W-300-50	300	50	1¼	⅝	1¾	7	5¼	17/32	$21 56
W-400-50	400	50	1¼	⅝	1¾	7	5¼	17/32	22.85
W-500-50	500	50	1¼	⅝	1¾	7	5¼	17/32	23.90
W-600-50	600	50	1½	¾	1¾	7	5¼	17/32	28.84
W-750-50	750	50	2	1	1¾	7	5¼	21/32	34.15
W-800-50	800	50	2	1	1¾	7	5¼	21/32	35.67
W-1000-50	1000	50	2½	1¼	1¾	7	5¼	21/32	42.50

TYPE W • 100 MV

CATALOG NUMBER	AMP	MV	A	B	C	D	F	G	LIST PRICE
W-120-100	120	100	1¼	⅝	1⅞	8¼	6½	17/32	$18.59
W-130-100	130	100	1¼	⅝	1⅞	8¼	6½	17/32	18.59
W-150-100	150	100	1½	¾	1⅞	8¼	6½	17/32	18.59
W-200-100	200	100	1½	¾	1⅞	8¼	6½	17/32	18.59
W-250-100	250	100	2	1	1⅞	8¼	6½	17/32	21.25
W-300-100	300	100	2	1	1⅞	8¼	6½	17/32	21.25
W-400-100	400	100	2	1	1⅞	8¼	6½	17/32	27.66
W-500-100	500	100	2½	1¼	1⅞	8¼	6½	17/32	34.41

TYPE WT



FOUR INSTRUMENT TERMINALS FURNISHED ON SHUNTS ABOVE 3000 AMPS.

TYPE WT • 50 MV

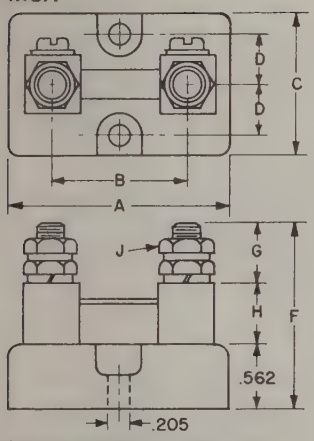
CATALOG NUMBER	AMP	MV	A	B	C	D	E	F	G	H	I	J	LIST PRICE
WT- 1000-50	1000	50	3	9 1/16	1½	2⅝	7 15/32	1½	¾	17/32	81/64	2	$ 62.12
WT- 1200-50	1200	50	3	9 1/16	1½	2⅝	7 15/32	1½	¾	17/32	81/64	2	64.23
WT- 1500-50	1500	50	3	9 1/16	2	2⅝	7 15/32	1½	¾	17/32	81/64	3	74.89
WT- 2000-50	2000	50	4	9 1/16	2	2⅝	7 15/32	2	1	17/32	81/64	3	89.80
WT- 2500-50	2500	50	4	15⅝	3	5½	11 55/64	2	1	21/32	1⅛	3	116.18
WT- 3000-50	3000	50	4	15⅝	3	5½	11 55/64	2	1	21/32	1⅛	4	137.75
WT- 4000-50	4000	50	5	15⅝	3	5½	11 55/64	2	1½	13/16	1⅛	4	227.32
WT- 5000-50	5000	50	5	15⅝	4	5½	11 55/64	2	1½	13/16	1⅛	5	268.68
WT- 6000-50	6000	50	6	15⅝	4	5½	12 23/64	2¼	1⅝	13/16	1 41/64	5	313.46
WT- 7500-50	7500	50	6	15⅝	4	5½	12 23/64	2¼	1⅝	13/16	1 41/64	6	362.06
WT- 8000-50	8000	50	6	15⅝	4	5½	12 23/64	2¼	1⅝	13/16	1 41/64	6	378.24
WT-10000-50	10000	50	8	15 55/64	4	5 17/32	12 55/64	3½	2¼	1 1/16	1½	6	516.90

TYPE WT • 100 MV

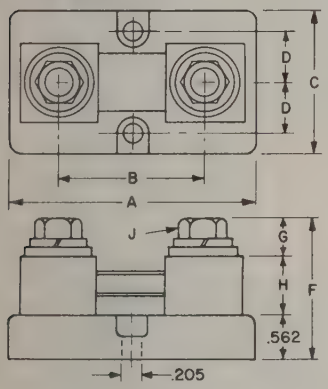
CATALOG NUMBER	AMP	MV	A	B	C	D	E	F	G	H	I	J	LIST PRICE
WT- 600-100	600	100	3	12	1½	2⅝	10½	1½	¾	17/32	¾	2	$ 67.81
WT- 750-100	750	100	3	12	1½	2⅝	10½	1½	¾	17/32	¾	2	70.58
WT- 800-100	800	100	3	12	1½	2⅝	10½	1½	¾	17/32	¾	2	81.09
WT-1000-100	1000	100	3	12	2	2⅝	10½	1½	¾	17/32	¾	3	84.44
WT-1200-100	1200	100	4	12	2	2⅝	10½	2	1	17/32	¾	3	92.46
WT-1500-100	1500	100	4	18½	3	5 9/32	15	2	1	21/32	1¾	3	125.67
WT-2000-100	2000	100	4	18½	3	5 9/32	15	2	1	21/32	1¾	3	149.14
WT-2500-100	2500	100	5	18½	3	5 9/32	15	2	1½	21/32	1¾	3	240.60
WT-3000-100	3000	100	5	18½	4	5 9/32	15	2	1½	21/32	1¾	4	280.07
WT-4000-100	4000	100	5	18 9/16	4	5 9/32	15	2½	1¼	13/16	1 25/32	4	321.05
WT-5000-100	5000	100	5	18 9/16	4	5 9/32	15	2½	1¼	13/16	1 25/32	5	427.58
WT-6000-100	6000	100	6	18 9/16	4	5 9/32	15½	3	1½	13/16	1 11/32	5	435.48

Dc Ammeter Shunts

MSA



MSB and MSC



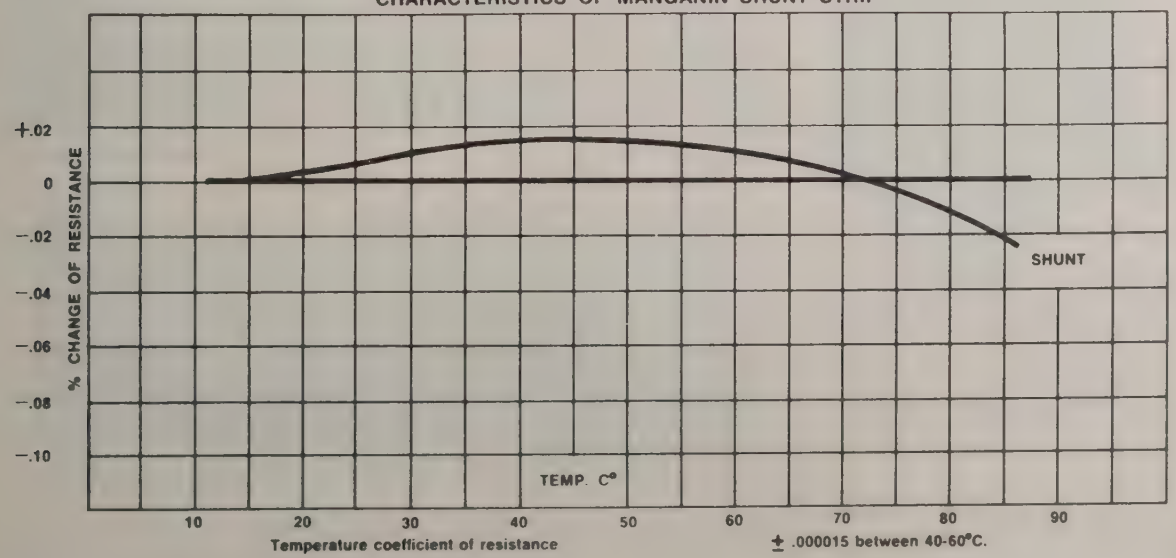
LIGHTWEIGHT TYPES

EMPRO CATALOG NUMBER	TYPE DESIGNATION	MS PART NUMBER	AMP	A	B	C	D	F	G	H	J
MLA-5-50			5	2.00	1.00	1.25	.437	1.688	.625	.500	¼-28
MLA-10-50	MSA100	MS91586-8	10	2.00	1.00	1.25	.437	1.688	.625	.500	¼-28
MLA-15-50	MSA150	MS91586-9	15	2.00	1.00	1.25	.437	1.688	.625	.500	¼-28
MLA-20-50	MSA200	MS91586-10	20	2.00	1.00	1.25	.437	1.688	.625	.500	¼-28
MLA-30-50	MSA300	MS91586-1	30	2.00	1.00	1.25	.437	1.688	.625	.500	¼-28
MLA-50-50	MSA500	MS91586-2	50	2.00	1.00	1.25	.437	1.688	.625	.500	¼-28
MLA-75-50	MSA750	MS91586-3	75	2.00	1.00	1.25	.437	1.688	.625	.500	¼-28
MLA-80-50	MSA800	MS91586-4	80	2.00	1.00	1.25	.437	1.688	.625	.500	¼-28
MLA-85-50	MSA850	MS91586-5	85	2.00	1.00	1.25	.437	1.688	.625	.500	¼-28
MLA-100-50	MSA101	MS91586-6	100	2.00	1.00	1.25	.437	1.688	.625	.500	¼-28
MLA-150-50	MSA151	MS91586-7	150	2.00	1.00	1.25	.437	1.688	.625	.500	¼-28
MLB-170-50	MSB171	MS91587-1	170	3.25	1.50	1.75	.625	1.750	.438	.750	⅜-16 x ⅝
MLB-200-50	MSB201	MS91587-2	200	3.25	1.50	1.75	.625	1.750	.438	.750	⅜-16 x ⅝
MLB-250-50	MSB251	MS91587-3	250	3.25	1.50	1.75	.625	1.750	.438	.750	⅜-16 x ⅝
MLB-300-50	MSB301	MS91587-4	300	3.25	1.50	1.75	.625	1.750	.438	.750	⅜-16 x ⅝
MLB-400-50	MSB401	MS91587-5	400	3.25	1.50	1.75	.625	1.750	.438	.750	⅜-16 x ⅝
MLB-450-50	MSB451	MS91587-6	450	3.25	1.50	1.75	.625	1.750	.438	.750	⅜-16 x ⅝
MLB-500-50	MSB501	MS91587-7	500	3.25	1.50	1.75	.625	1.750	.438	.750	⅜-16 x ⅝
MLB-600-50	MSB601	MS91587-8	600	3.25	1.50	1.75	.625	1.750	.438	.750	⅜-16 x ⅝
MLC-800-50	MSC801	MS91588-1	800	4.50	2.156	2.50	1.00	2.125	.562	1.00	½-13 x ⅞
MLC-1000-50	MSC102	MS91588-2	1000	4.50	2.156	2.50	1.00	2.125	.562	1.00	½-13 x ⅞
MLC-1200-50	MSC122	MS91588-3	1200	4.50	2.156	2.50	1.00	2.125	.562	1.00	½-13 x ⅞

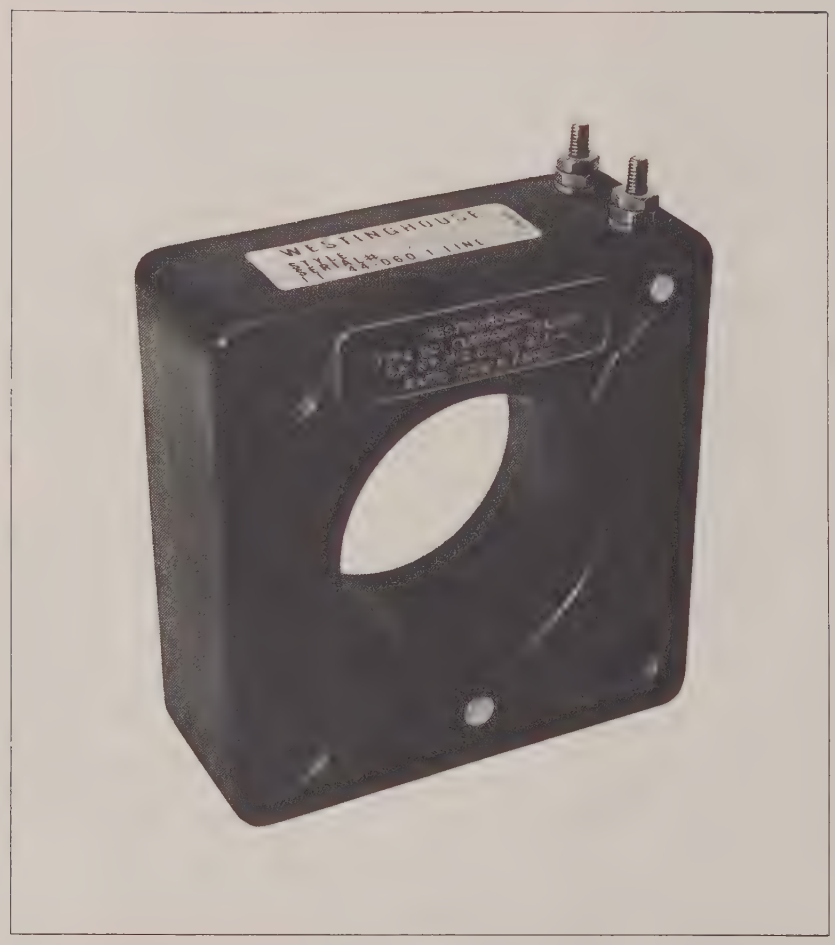
For prices on lightweight types, Contact Weschler

Bakelite bases are furnished. ABS Cycolal bases are available for MSA on request at no additional cost

CHARACTERISTICS OF MANGANIN SHUNT STRIP



75 D



Application

The Type ECI is a rubber molded indoor current transformer for use with indicating instruments for switchboards and other industrial applications. It is not recommended for use where a high degree of accuracy is required.

Ratings

ANSI Metering Accuracy (60 Hertz)

100 through 250 Amperes – 1.2 Class for B-0.1

300 through 800 Amperes – 0.6 Class for B-0.1 and B-0.2

Continuous Current Rating Factor:

1.33 at 30°C Ambient

1.00 at 55°C Ambient

Selector Guide

Primary Ampere Rating①	Style Numbers	List Price
100	237A970G01	$23.00
150	237A970G02	23.00
200	237A970G03	23.00
250	237A970G04	23.00
300	237A970G05	23.00
400	237A970G06	23.00
500	237A970G07	23.00
600	237A970G08	23.00
800	237A970G09	23.00

Note: Mounting feet, when required, must be ordered as a separate item. A complete set for one transformer includes feet, nuts, bolts, and washers. They are not furnished assembled on the transformer.

Style Number 447C337G03..... $3.00

① Secondary current rating is 5 amperes.

All units normally stock

Construction Features

Primary Opening

The large primary opening is adequate for bus bar or cable and is particularly suitable for extra turns when required in multiple ratio applications.

Core and Coils

The ring type core is assembled within an insulating shell and is toroidally wound with a distributed secondary winding. The whole assembly is then completely enclosed in molded rubber insulation.

Secondary Terminals

The secondary terminals are stud type.

Markings

Complete identification along with ratings and polarity marker are permanently molded into the body of the transformer.

Mounting

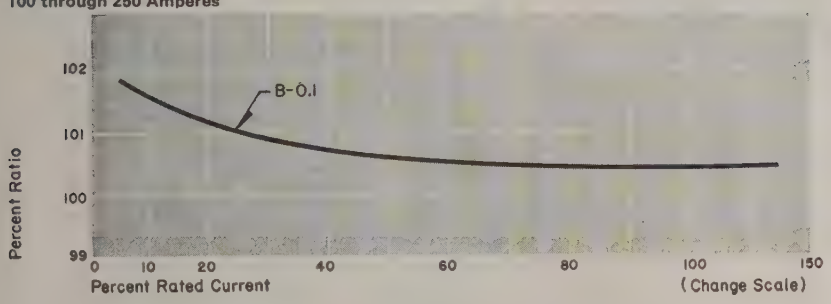
The ECI can be flush mounted to panel or platform by means of bolts through any pair of mounting holes provided in the body of the transformer. Steel mounting feet with hardware are also available, as a separate item, to mount the transformer in an upright position with secondary terminals in either a vertical or horizontal plane.

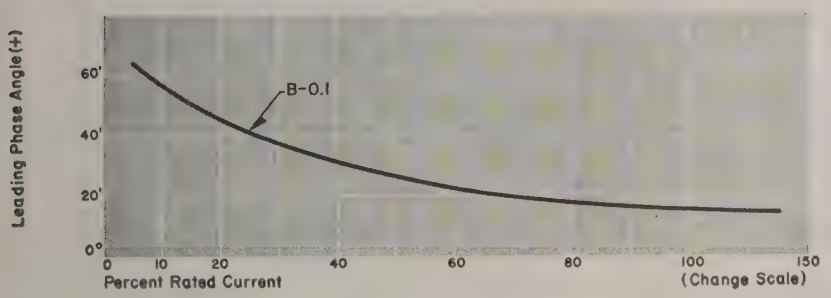
Type ECI Current Transformers

600 Volts, Indoor, 10 Kv BIL
Primary Amperes: 100 Through 800
25 Through 400 Hertz

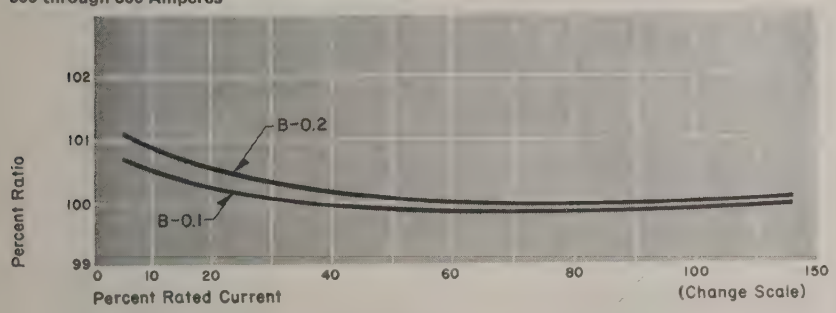
Performance Curves

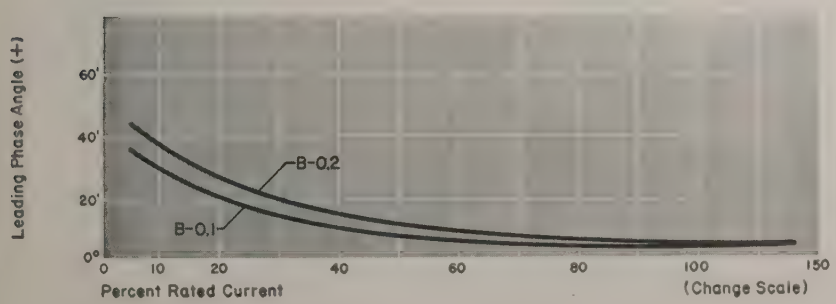
100 through 250 Amperes



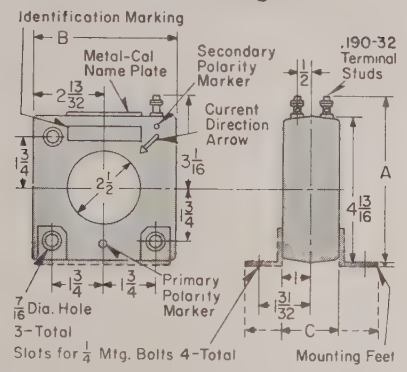


300 through 800 Amperes

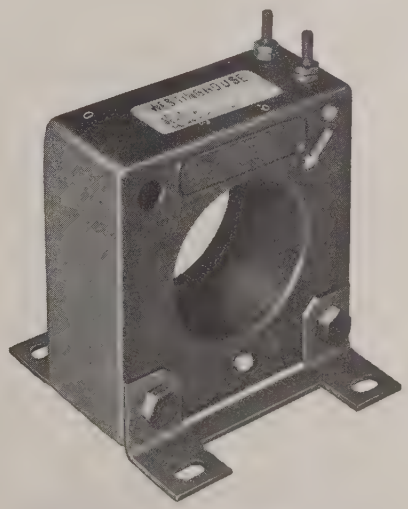




Dimensions and Weights



Primary Ampere Rating	Max. Dimensions: Inches A	B	C	Approx. Wt.: Lbs. Net	Shipping
Without Mounting Feet					
100 thru 800	5 7/16	4 13/16	2	4	5
With Mounting Feet					
100 thru 800	5 17/32	4 13/16	4 11/16	4½	5½



ECI with Mounting Feet Assembled

Instructions for Use of ECI as a Variable Ratio Transformer

The nameplate rating of the Type ECI current transformer is based on the condition that the primary conductor will be passed once through the transformer opening. The rating can be reduced in even multiples by looping this conductor two or more times through the opening. A transformer having a rating of 200 to 5 amperes will be changed to 50 to 5 amperes if four loops or turns are made with the primary cable as illustrated in Figure 1.

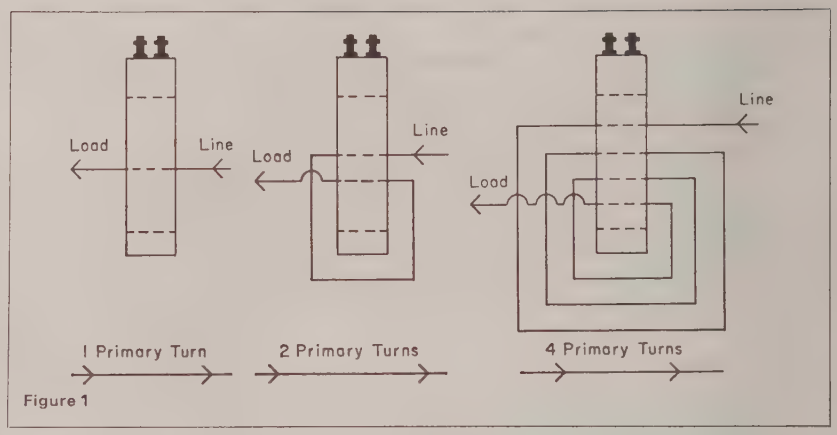


Figure 1

Changes in rating can also be accomplished by means of external turns added to or subtracted from the secondary winding. Due to the relatively large number of turns in this winding, these changes occur in small steps. Figure 2 shows how turns may be added to the secondary winding by connecting to the "non-polarity" (X_2) terminal stud and winding on turns in the direction of the arrow. Figure 3 shows how turns can be subtracted from the secondary winding by connecting to the "polarity" (X_1) terminal stud and winding on turns in the direction of the arrow.

A frequent application of the window type current transformer is for use with a 5 amp ammeter in motor load measurements. The same meter can be used for different size motors by making ratio adjustments as described above. The table on page 4 can be used to select the desired ratio and to determine the necessary primary and/or secondary turns for converting one of the standard rated transformers to this value.

Calculations for this application are illustrated in the example below:

1. Determine the full load current of the motor, i.e., 140 amperes.
2. Determine full scale marking of meter dial, i.e., 0-150%.
3. Determine primary current by multiplying the motor full-load current by the full-scale meter marking, then dividing by 100.

   Example: $140 \times \frac{150}{100} = 210$ Amperes
4. Use the table on right to determine the number of primary and secondary turns needed for the particular transformer available.

   Example: 200:5 ampere transformer – use 1-turn primary and add two turns to secondary; 400:5 ampere transformer – use two turns primary and add four turns to secondary.

1 Primary Turn		2 Primary Turns		4 Primary Turns	
Name-plate Ratio	Actual Ratio	Name-plate Ratio	Actual Ratio	Name-plate Ratio	Actual Ratio
100:5	100:5	100:5	50:5	100:5	25:5
150:5	150:5	150:5	75:5	150:5	37.5:5
200:5	200:5	200:5	100:5	200:5	50:5
300:5	300:5	300:5	150:5	300:5	75:5
400:5	400:5	400:5	200:5	400:5	100:5
500:5	500:5	500:5	250:5	500:5	125:5
600:5	600:5	600:5	300:5	600:5	150:5
800:5	800:5	800:5	400:5	800:5	200:5

Figure 2: To Add Secondary Turns

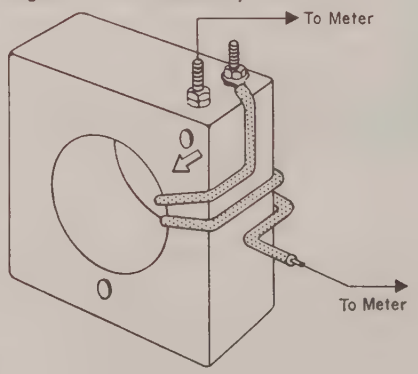
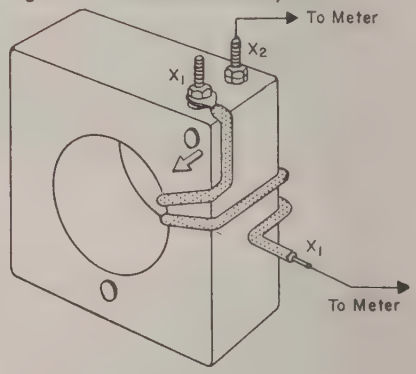


Figure 3: To Subtract Secondary Turns



Type ECI Current Transformers

600 Volts, Indoor, 10 Kv BIL
Primary Amperes: 100 Through 800
25 Through 400 Hertz

Table to Determine Needed Number of Primary and Secondary Turns

Primary Current for Secondary Current of 5 Amperes							Primary Turns	Secondary Turns
100/5 Ratio	150/5 Ratio	200/5 Ratio	300/5 Ratio	400/5 Ratio	500/5 Ratio	600/5 Ratio		
150	200	250	350	450	550	650	1	+10
145	195	245	345	445	545	645	1	+ 9
140	190	240	340	440	540	640	1	+ 8
135	185	235	335	435	535	635	1	+ 7
130	180	230	330	430	530	630	1	+ 6
125	175	225	325	425	525	625	1	+ 5
120	170	220	320	420	520	620	1	+ 4
115	165	215	315	415	515	615	1	+ 3
110	160	210	310	410	510	610	1	+ 2
105	155	205	305	405	505	605	1	+ 1
100	150	200	300	400	500	600	1	0
95	145	195	295	395	495	595	1	− 1
90	140	190	290	390	490	590	1	− 2
85	135	185	285	385	485	585	1	− 3
80	130	180	280	380	480	580	1	− 4
75	125	175	275	375	475	575	1	− 5
70	120	170	270	370	470	570	1	− 6
65	115	165	265	365	465	565	1	− 7
60	110	160	260	360	460	560	1	− 8
55	105	155	255	355	455	555	1	− 9
50	100	150	250	350	450	550	1	−10
75	100	125	175	225	275	325	2	+10
72.5	97.5	122.5	172.5	222.5	272.5	322.5	2	+ 9
70	95	120	170	220	270	320	2	+ 8
67.5	92.5	117.5	167.5	217.5	267.5	317.5	2	+ 7
65	90	115	165	215	265	315	2	+ 6
62.5	87.5	112.5	162.5	212.5	262.5	312.5	2	+ 5
60	85	110	160	210	260	310	2	+ 4
57.5	82.5	107.5	157.5	207.5	257.5	307.5	2	+ 3
55	80	105	155	205	255	305	2	+ 2
52.5	77.5	102.5	152.5	202.5	252.5	302.5	2	+ 1
50	75	100	150	200	250	300	2	0
47.5	72.5	97.5	147.5	197.5	247.5	297.5	2	− 1
45	70	95	145	195	245	295	2	− 2
42.5	67.5	92.5	142.5	192.5	242.5	292.5	2	− 3
40	65	90	140	190	240	290	2	− 4
37.5	62.5	87.5	137.5	187.5	237.5	287.5	2	− 5
35	60	85	135	185	235	285	2	− 6
32.5	57.5	82.5	132.5	182.5	232.5	282.5	2	− 7
30	55	80	130	180	230	280	2	− 8
27.5	52.5	77.5	127.5	177.5	227.5	277.5	2	− 9
25	50	75	125	175	225	275	2	−10
50	66.7	83.3	116.7	150	183.3	216.7	3	+10
48.3	65	81.7	115	148.3	181.7	215	3	+ 9
46.7	63.3	80	113.3	146.7	180	213.3	3	+ 8
45	61.7	78.3	111.7	145	178.3	211.7	3	+ 7
43.3	60	76.7	110	143.3	176.7	210	3	+ 6
41.7	58.3	75	108.3	141.7	175	208.3	3	+ 5
40	56.7	73.3	106.7	140	173.3	206.7	3	+ 4
38.3	55	71.7	105	138.3	171.7	205	3	+ 3
36.7	53.3	70	103.3	136.7	170	203.3	3	+ 2
35	51.7	68.3	101.7	135	168.3	201.7	3	+ 1
33.3	50	66.7	100	133.3	166.7	200	3	0
31.7	48.3	65	98.3	131.7	165	198.3	3	− 1
30	46.7	63.3	96.7	130	163.3	196.7	3	− 2
28.3	45	61.7	95	128.3	161.7	195	3	− 3
26.7	43.3	60	93.3	126.7	160	193.3	3	− 4
25	41.7	58.3	91.7	125	158.3	191.7	3	− 5
23.3	40	56.7	90	123.3	156.7	190	3	− 6
21.7	38.3	55	88.3	121.7	155	188.3	3	− 7
20	36.7	53.3	86.7	120	153.3	186.7	3	− 8
18.3	35	51.7	85	118.3	151.7	185	3	− 9
16.7	33.3	50	83.3	116.7	150	183.3	3	−10

Primary Current for Secondary Current of 5 Amperes							Primary Turns	Secondary Turns
100/5 Ratio	150/5 Ratio	200/5 Ratio	300/5 Ratio	400/5 Ratio	500/5 Ratio	600/5 Ratio		
35	47.5	60	85	110	135	160	4	+ 8
33.7	46.2	58.7	83.7	108.7	133.7	158.7	4	+ 7
32.5	45	57.5	82.5	107.5	132.5	157.5	4	+ 6
31.2	43.7	56.2	81.2	106.2	131.2	156.2	4	+ 5
30	42.5	55	80	105	130	155	4	+ 4
28.7	41.2	53.7	78.7	103.7	128.7	153.7	4	+ 3
27.5	40	52.5	77.5	102.5	127.5	152.5	4	+ 2
26.2	38.7	51.2	76.2	101.2	126.2	151.2	4	+ 1
25	37.5	50	75	100	125	150	4	0
23.7	36.2	48.7	73.7	98.7	123.7	148.7	4	− 1
22.5	35	47.5	72.5	97.5	122.5	147.5	4	− 2
21.2	33.7	46.2	71.2	96.2	121.2	146.2	4	− 3
20	32.5	45	70	95	120	145	4	− 4
18.7	31.2	43.7	68.7	93.7	118.7	143.7	4	− 5
17.5	30	42.5	67.5	92.5	117.5	142.5	4	− 6
26	36	46	66	86	106	126	5	+ 6
25	35	45	65	85	105	125	5	+ 5
24	34	44	64	84	104	124	5	+ 4
23	33	43	63	83	103	123	5	+ 3
22	32	42	62	82	102	122	5	+ 2
21	31	41	61	81	101	121	5	+ 1
20	30	40	60	80	100	120	5	0
19	29	39	59	79	99	119	5	− 1
18	28	38	58	78	98	118	5	− 2
17	27	37	57	77	97	117	5	− 3
16	26	36	56	76	96	116	5	− 4
15	25	35	55	75	95	115	5	− 5
20.8	29.2	37.5	54.2	70.8	87.5	104.2	6	+ 5
20	28.3	36.7	53.2	70	86.7	103.3	6	+ 4
19.2	27.5	35.8	52.5	69.2	85.8	102.5	6	+ 3
18.3	26.7	35	51.7	68.3	85	101.7	6	+ 2
17.5	25.8	34.2	50.8	67.5	84.2	100.8	6	+ 1
16.7	25	33.3	50	66.7	83.3	100	6	0
15.8	24.2	32.5	49.2	65.8	82.5	99.1	6	− 1
15	23.3	31.7	48.3	65	81.7	98.3	6	− 2
14.2	22.5	30.8	47.5	64.2	80.8	97.5	6	− 3
13.3	21.6	30	46.7	63.3	80	96.7	6	− 4
17.1	24.3	31.4	45.7	60	74.3	88.6	7	+ 4
16.4	23.6	30.7	45	59.3	73.6	87.9	7	+ 3
15.7	22.9	30	44.3	58.6	72.9	87.1	7	+ 2
15	22.1	29.3	43.6	57.9	72.1	86.4	7	+ 1
14.3	21.4	28.6	42.9	57.1	71.4	85.7	7	0
13.6	20.7	27.9	42.1	56.4	70.7	85	7	− 1
12.9	20	27.1	41.4	55.7	70	84.3	7	− 2
12.1	19.3	26.4	40.7	55	69.3	83.6	7	− 3
11.4	18.6	25.7	40	54.3	68.6	82.9	7	− 4
14.4	20.7	26.9	39.4	51.9	64.3	76.9	8	+ 3
13.8	20.1	26.3	38.8	51.3	63.7	76.3	8	+ 2
13.1	19.4	25.6	38.1	50.6	63.1	75.6	8	+ 1
12.5	18.8	25	37.5	50	62.5	75	8	0
11.9	18.2	24.4	36.9	49.4	61.9	74.4	8	− 1
11.2	17.6	23.8	36.3	48.8	61.2	73.8	8	− 2
10.6	16.9	23.1	35.6	48.1	60.6	73.1	8	− 3
12.8	18.3	23.9	35	46.1	57.2	68.3	9	+ 3
12.2	17.7	23.3	34.4	45.5	56.7	67.8	9	+ 2
11.7	17.2	22.8	33.9	45	56.1	67.2	9	+ 1
11.1	16.7	22.2	33.3	44.4	55.6	66.7	9	0
10.5	16.1	21.7	32.8	43.9	55.0	66.1	9	− 1
10.0	15.5	21.1	32.2	43.3	54.4	65.5	9	− 2
9.4	15	20.5	31.7	42.8	53.9	65.0	9	− 3
11.5	16.5	21.5	31.5	41.5	51.5	61.5	10	+ 3
11.0	16	21	31	41	51	61	10	+ 2
10.5	15.5	20.5	30.5	40.5	50.5	60.5	10	+ 1
10.0	15	20	30	40	50	60	10	0
9.5	14.5	19.5	29.5	39.5	49.5	59.5	10	− 1
9.0	14	19	29	39	49	59	10	− 2
8.5	13.5	18.5	28.5	38.5	48.5	58.5	10	− 3

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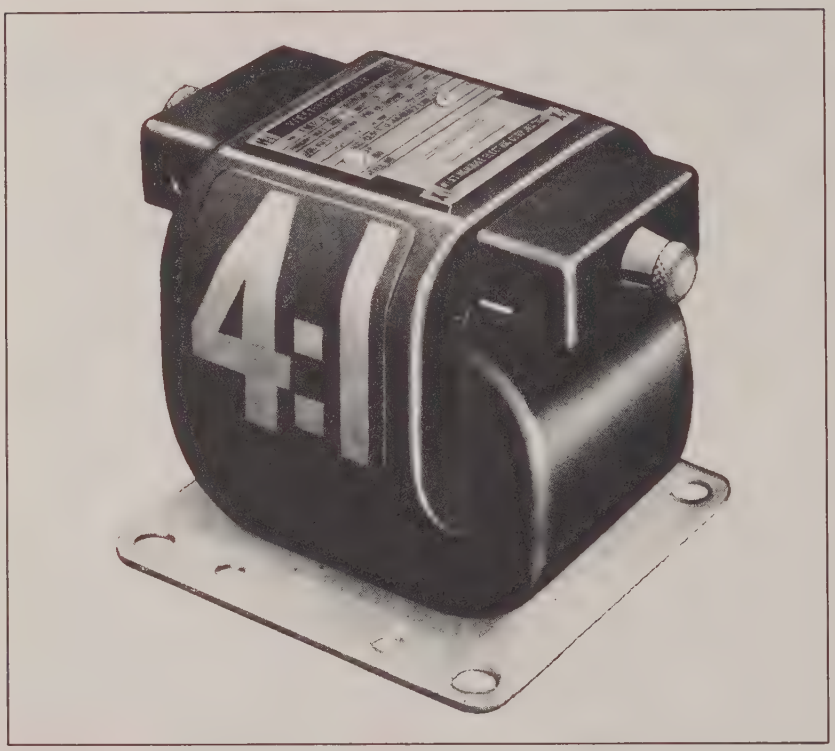


Selector Guide

Primary Volts	Winding Ratio	Without Terminal Covers Style Number	List Price	With Terminal Covers Style Number	List Price
240	2:1	254A476G01	$89.00	254A478G01	$93.00
288	2.4:1	254A476G02	89.00	254A478G02	93.00
300	2.5:1	254A476G05	89.00	254A478G05	93.00
480	4:1	254A476G03	91.00	254A478G03	95.00
600	5:1	254A476G04	91.00	254A478G04	95.00

All units normally stock.

Application

The type EMP is a small, light-weight molded potential transformer particularly designed for light metering burdens in applications where size and weight are at a premium.

Accuracy

USASI Metering Accuracy Class (60 Hz.):

0.6 Class for W Burden
1.2 Class for X Burden

Type EMP will maintain 0.3 metering accuracy for most single meter applications.

Ratings

Thermal Rating

150 va at 30° C ambient,
100 va at 55° C ambient

Temperature Rise

55° C at 30° C ambient,
30° C at 55° C ambient

Construction Features

Core and Coils

Premolded forms are used for the winding spool and terminal brackets. A wound type core is assembled with the coil by banding the two securely into a cradle form. This rigid assembly is then completely enclosed in rubber.

Primary and Secondary Terminals

The terminals are stud type. Polarity markings and high and low voltage identification are molded in raised letters in the body of the transformer. Sealable terminal covers can be supplied for high and low voltage.

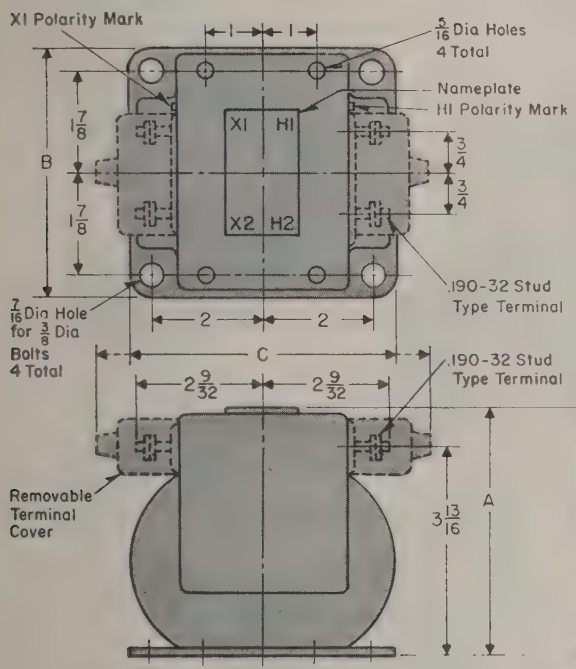
Base Mounting

A detachable aluminum base comes with all ratings.

Type EMP Potential Transformers

600 Volts, Outdoor, 10 Kv BIL, Primary
Volts: 240 through 600, 60 Hertz

Dimensions and Weights

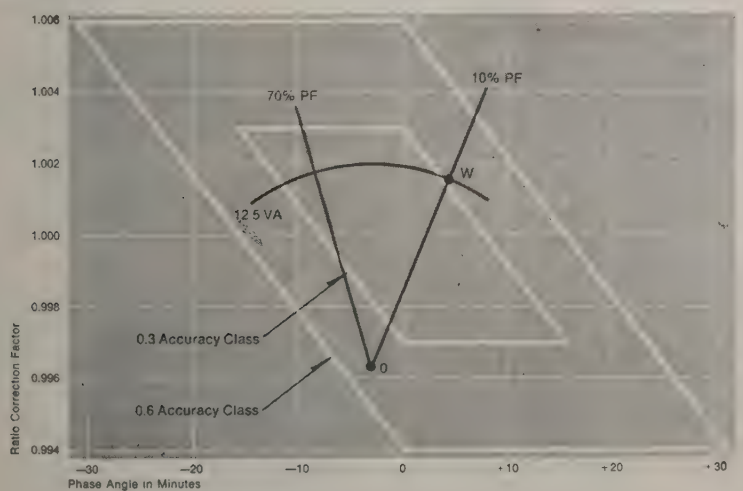


	Maximum Dimensions: Inches		
	A	B	C
Without Covers	4½	4½	4¾
With Covers	4½	4½	6⅛

Weights: Net 9 lbs.
Shipping 11 lbs.

Performance Curve

Typical ratio correction factors and phase angle values plotted for standard burdens, using the Farber Method ("The Analytical and Graphical Determination of Complete Potential Transformer Characteristics", Settles, Farber, Conner, AIEE Transaction Paper 60-1246, October, 1960).



Application

The Type W-2 switch is designed for use as an instrument, control or general purpose switch. It is compact, yet of sufficient size to provide long, trouble-free service when applied within the specified ratings.

Design flexibility of internal parts and contacting, plus external jumpering of the contact studs affords almost limitless switching combinations for relatively few standard components. The design flexibility is provided in the basic switch styles. A complete switch is made up of a basic switch style, one of several styled handles, a nameplate connector diagram style and a nameplate.

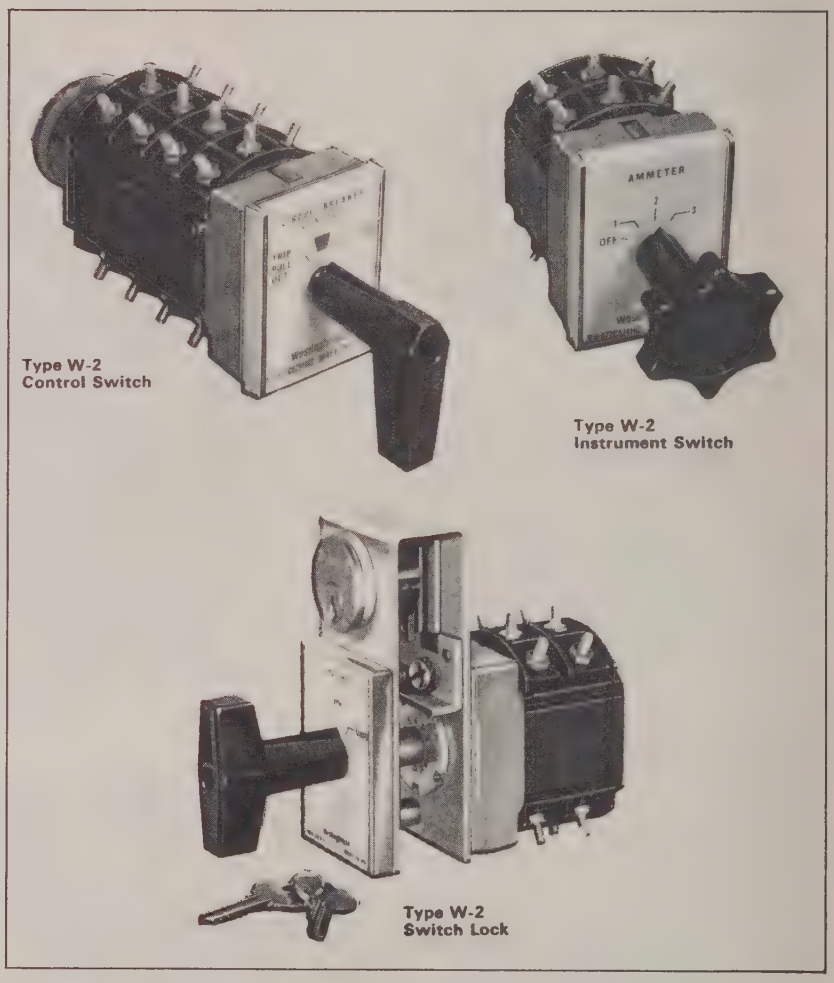
The W-2 switch may be ordered as a single style unit where such a style meets a specific application. Where a single listed style does not meet a specific application, the desired switch may be ordered by specifying the required styled components.

Instrument Switches: Maintained contact type for use with all classes of electrical instruments, relays, meters, and for performing various circuit combinations. Designed for panel mounting and equipped with handles for manual operation.

Control Switches: Momentary contact type being spring return to the original or "off" position. For use with circuit breakers and other electrically controlled apparatus. Panel mounting. Handles for manual operation.

The Type W-2 switch can be furnished with a tumbler pin keylock. Such lock can be assembled either to the right or to the left of the switch unit on the horizontal center line, or, as is considered standard, above the switch unit on the vertical center line as shown in the illustration. The unit is so designed as to permit locking the switch in any one or in each of several positions. The position or positions in which a switch is to be locked must be specified on order.

The style numbers shown in this bulletin apply to switches for mounting on ⅛ – ¼ inch thick panels only. Switches for mounting on thicker panels may be ordered as "similar to" a desired style except for thick panel.



Type W-2
Control Switch

Type W-2
Instrument Switch

Type W-2
Switch Lock

Advantages

Small Size
Variable Circuitry by "You Wire It"
More Contacts per Unit Volume
Roller-Wipe Spring Actuated Contacting
Momentary and Maintained Contact Designs, or in Combination
Greater Availability of Contacts with Terminal Identification for Automated Wiring or Application Changes in Field, See Page 23
Double Break Contacts per Stage

For complete information, request Bulletin DB 34-251 which contains:

Application	1
Design Features	2
Operation	3
Construction Details	4
Standard Switches	5
Position Tabulations	6-17
Basic Switches	18
Additional Position Tabulations	19-22
Dimensions	22
Ordering Information	23-24

Instrument and Control Switches, Type W-2

600 Volts, 20 Ampere
Continuous Capacity

Design Features

General Construction

The W-2 switch consists essentially of an operating handle, face plate, control housing, contact frame assembly and rotor assembly. It can be built up in any number of stages from 1 to 9, which stages are clamped together and to the control housing by two tie bolts. A steel operating shaft ties the contact rotors together. A metal cover on the rear holds the position stop pins, retains the shaft and provides basic switch identification. For push or pull switches, the metal cover is replaced by a polycarbonate cover which houses the pull-out mechanism.

Switch Positions

Each switch has a minimum of two and a maximum of twelve rotary positions with a 30° throw between positions, irrespective of the number. Each rotary position coincides precisely with the nameplate markings. The degree of throw between positions is fixed and cannot be changed. The number of positions of each switch can be altered by removing the rear cover and changing the position of the "stop" pin or pins located in the rear housing spacer. In addition to rotary motion, the W-2 switch can be provided with a lateral movement (push-pull) of the rotor.

Contact Frames

Two contact frame sizes are available; the half frame with six sets of contacts; three sets on the top at 11, 12 and 1 o'clock positions and three sets on the bottom at 5, 6 and 7 o'clock positions. The full frame with 12 sets of contacts, each set located at 30° intervals around its perimeter as are the numbers on a clock. The contact frames are made of glass polyester insulating material.

Contacts

Switches are usually referred to as "so many stages long". For a W-2 switch, a stage of contacts consists of a contact frame (either 6 or 12 contact sets) and a rotor.

At every position location on the frame, there are two contact terminal studs in line (a set) per stage. Each of these studs is one piece, made of bronze alloy and silver plated.

Rotors

The rotors are standard in design and hold the roller contacts. Each rotor, made of glass polyester insulating material, rotates independently between the stage spacer plates. The rotor assembly is equipped with one to six rollers (as determined by the required circuitry) each of which makes contact with two adjacent stationary terminal studs to complete a circuit and so affording a double, series break contact. The silver-plated bronze alloy roller contacts provide a rolling, wiping action, are self-aligning on assembly and require no adjustment of contact pressure for the life of the switch.

Contact Flexibility

Basic "you wire it" flexibility is available in the Type W-2 switch. While the internal contacting is standardized for each basic type of switch; such as ammeter, voltmeter, circuit breaker, etc., by using available insulated jumpers, connections between external switch terminals can be made to obtain the desired contacting for a specific application. This minimizes the number of basic styled switches that otherwise would be required.

Switch Dial

The Type W-2 switch dial consists of two parts; i.e., a dial plate and a nameplate.

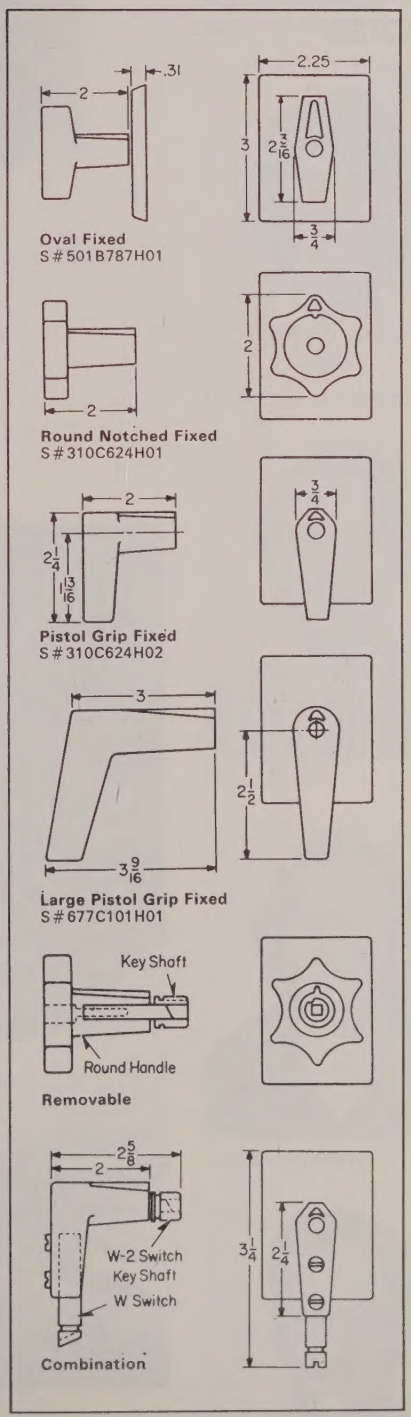
The standard control switch dial plate is die cast aluminum, with red and green target parts, where required, and serves as the base for mounting the nameplate. The nameplate is made of a white ABS material on which is stamped in black the desired position markings.

Handles

Handles for the Type W-2 switch are made of a phenolic insulating material designed to afford a smooth, easy, and comfortable grip of pleasing appearance. Each handle has a recessed arrow molded into it as a visual aid in positioning.

The handles are made in four shapes, i.e., oval, round, pistol grip, and large pistol grip. Each of the shapes can be obtained in the fixed type or the removable key type. The fixed handles are fastened to the switch shaft by a screw through the front of the handle.

There is also available a combination removable key type handle in the pistol grip shape that can be used to operate both the Type W-2 and the Type W switches designed for removable key operation.



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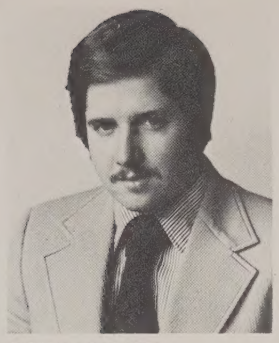

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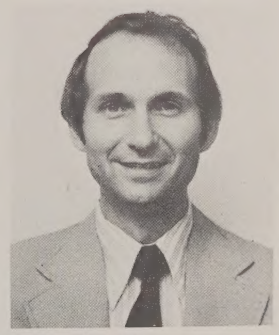
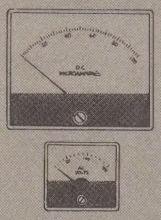
Group planning insures quality products and accurate deliveries to meet the customer's needs. New products are in constant development to enable Weschler to stay abreast of the industry.



DALE ELGIN

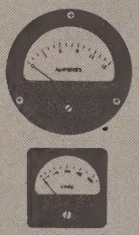
JANE KOCHMIT

Fast-Find Index



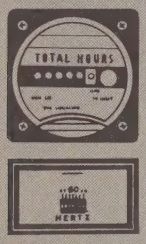
Panel Instruments
Custom-Styled
20/20 Line
2½", 3½", 4½", 5½"

Page 2-12



Panel Instruments
Conventional
Round, Square
3½", 4½"

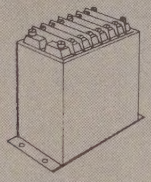
Page 13-27



Elapsed Time Meters

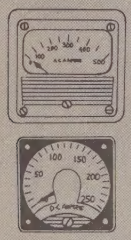
Vibrating Reed Frequency Meters

Page 28-33



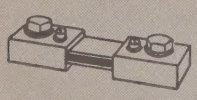
Transducers

Page 34-38



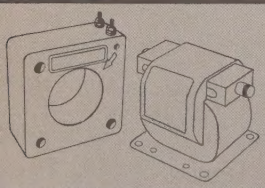
Switchboard Instruments
Circular Scale
100° Scale
Edgewise

Page 39-42



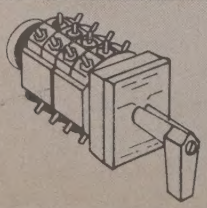
Shunts

Page 43-47



Current Transformers
Potential Transformers

Page 48-53



Instrument Switches

Page 54-55

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